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PRESENT METHODS OF PREPARATION OF THE NERVOUS SYSTEM.

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The nervous system, including as it does a variety of component tissues, epiblastic and mesoblastic in nature, requires a considerable number of methods of treatment for the accurate microscopic presentation of the elements, nerve cell and fibre, neuroglia, blood-vessel, and, in its peripheral portions, the component sheaths and fibrillæ entering into the formation of the nerve bundles of the neuro-muscular terminations.

While great advances have been made in the last decennary in methods of staining for accurate examination into the intimate structure of nerve tissue, histological methods have far surpassed those of pathological research, and to-day the discovery of a ready means of bringing into view the nerve cell in its entirety, permitting at the same time a view of its finest structures, is much needed, and is the aim of every neuro-pathologist.

The methods of preparation detailed in the following pages have been all used, either by the writer or by others in the anatomical and pathological laboratories of the Johns Hopkins University.

METHODS FOR THE PRESERVATION OF THE ENTIRE BRAIN.

Before beginning the larger section of this article, a few lines on the preservation of the entire brain and cord may not be inappro-

priate, as it is often desirable to keep a cerebrum, for demonstration or for legal purposes, and at the same time so preserve it that, if necessary, stained sections may be had at some future time.

Formol.—By far the best agent we have for this purpose is the solution of formaldehyde (HCOH) commercially known under the name of *Formol.* As a method of tissue preservation it was introduced by the elder Blum more than four years ago, and has successfully stood the test of time. Ten per cent. solutions are most frequently used (it should be remembered that the formol solution contains only about 40 per cent. of the gas, hence a 10 per cent. solution contains actually less than five per cent. of formaldehyde).

A brain laid in this fluid, and changed once or twice, when the quantity of surrounding solution is not large, will, at the end of several months, still preserve its natural colors, and even the blood contained in the smaller vessels will have the red tints of hemaglobin. Solutions of less strength may be used, and even 1 per cent. will preserve tissues, but the results are not so good as with the stronger mixture.

The great benefit derived from using formol solutions is that they penetrate evenly and very rapidly, so that the central portions of a hemisphere are equally as well hardened as the periphery, and accordingly, provided the solutions are of the proper strength, there is no danger of an over-hardened cortex and a decomposed medullary mass. It has, too, the advantage that the process of after-hardening, for the aims of microscopic work, may be completed in Müller's fluid, in alcohol, or in any of the various chromic acid salts now in vogue. The disadvantage of the formol solution lies in the fact that it causes considerable swelling of the brain substance from absorption of water, and consequent distortion. This is much more true for the weaker than for the stronger solutions. In a 1 per cent. solution a brain, according to Flatau, will gain 14 per cent. of its weight in two days, and at the end of a month 23 per cent.; while in a 10 per cent. solution at the end of the month it will gain only two or three per cent. Admixtures of formol and ethyl alcohol have been suggested to counteract this swelling, the proportion of equal parts of a 10 per cent. solution formol and 60 per cent. alcohol solution seeming most appropriate. Combinations with

acetate of potash and other salts have been advised, but, from the experience of the writer, these have seemed to be without benefit. Brains hardened in formol have the great advantage that within three or four days they are sufficiently firm to permit handling.

If at any time a brain so hardened should be needed for class or demonstration specimens, after a short immersion in 96 per cent. alcohol, a coating of thin celloidin may be applied to it with a camel's hair brush, and dried in the air. If this cerebrum is then reimmersed in formol-alcohol solution it can lie exposed to the atmosphere for hours without injury.

Ordinary Ethyl Alcohol, while useful when formol is not to be had, has many disadvantages. Unless great care is taken to change the specimens frequently, the tissues shrink unevenly and the preparation has an unsightly appearance. Besides, the alcohol does not penetrate so rapidly as the formol, and the danger that interior spots may soften is greater. The best mode of employing it is to place the entire brain, usually stripped of the meninges, in a sufficient quantity of a 60 per cent. solution, to change it after a few hours to an 80 per cent., and after several days to an 85 per cent. solution.

Müller's Fluid, except for its cheapness, cannot be recommended for the preservation of brains in toto, if it is desired to keep them for any length of time. The pia mater should be carefully stripped off and the brain immersed in a large quantity of the fluid. This should be changed at the end of six hours, and then daily for a week, or until the fluid remains perfectly clear, and thereafter at the end of each month. Unless the hardening process is made at a temperature above 70° F. there is great liability that only the outer shell of the hemispheres will harden properly, while the interior white substance will become softened and ready to break down on handling. Müller's fluid hardening is to be recommended when it is necessary to keep a brain for a few weeks for legal or demonstration purposes and afterward immediately to make a microscopic examination by the Weigert or Pal method.

The *Zinc Method of Giacomini* gives fairly good permanent preparations. The fresh brain is laid for eight or ten hours in a ten per cent. solution of zinc chloride and turned frequently.

At the end of this period the pia is removed. It is now replaced in the fluid and allowed to remain several days, or until it has shrunk considerably. It is changed then to 80 or 90 per cent. spirit, and afterwards changed every two or three days, and, when well hardened, laid in glycerine to which 1 per cent. of pure carbolic acid is added. After the glycerine has completely penetrated the tissues the preparation is placed on an inclined glass plate and the superfluous glycerine allowed to run off. Preparations made in this manner may be exposed to the air for years without injury. It is recommended to inject the carotid arteries with the zinc solution in event the brain is not very fresh.

Plastic Reproduction.—A somewhat troublesome but very satisfactory method of preserving uncommon brain specimens is by *Plastic Reproduction.* The brain is hardened in strong formol, or even better, in formol and alcohol, until quite firm, and dehydrated for a day in 96 per cent. alcohol. A paper box of sufficient size to hold the entire brain conveniently is then procured, into which the brain is placed and well supported. A mixture of equal parts of bees-wax and rosin is melted together, thoroughly stirred, and poured into the box, just sufficient to cover one-half of the brain. This is allowed to thoroughly cool. Then the upper surface of the wax is sprinkled with powdered soapstone or thoroughly anointed with oil, and sufficient melted wax and rosin poured into the box to more than cover the brain. After again cooling, the halves are separated, the brain removed, a small aperture bored into the shell, and calcined plaster of Paris, mixed with sufficient water to flow easily, is poured into the mould. The model when removed is an exact reproduction of the brain, and may be painted with oil color to resemble the original preparation. The use of plaster of Paris instead of ordinary wax to form the model has many advantages over the method introduced by Berliner, as the wax does not take colors easily and is liable to become soft at summer temperatures.

Section of the Brain with a View to After-Microscopic Examination.

Of the several methods of sectioning the hemispheres, the method of Virchow, and the modification of the same commended by Weigert, are entirely unsuited for the purposes of after-micro-

scopic examination. The single method that is at all adapted to the purpose is a modification of the method of Pitres. Not only does this method permit an exact localization of any focal disease, but it ensures complete penetration of the fixing agents into the cerebral substance.

The first essential is a broad double-edge knife, such as is made by Walb of Heidelberg, for the purpose.

The Pitres method calls for the first cut through the hemispheres to be made 5 cm. in front of the central fissure; the second at the level of the calcarine fissure. This divides the hemispheres into three unequal portions, the middle or fronto-parietal being the largest. This portion is now subdivided by four further cuts, the first through the rear portion of the frontal convolutions, the second through the anterior central convolution, the third through the postero-central convolution, and the last through the posterior portion of the temporal convolutions.

For both macroscopic and microscopic ends it is all-sufficient to divide the hemispheres with clean sweeps of the knife from the anterior to the posterior poles at intervals of 2.5 cm. The brain should be placed on a thick towel and divided with single strokes, the hemispheres being held together by the pressure of the hand. The gray matter, centrum ovale, corpus callosum, ventricles, internal capsule, and ganglia, are successively presented to view, and in such a manner as to enable one to detect the slightest departure from the normal. Afterwards the several sections are placed in a vessel upon cotton, and sufficient preservative fluid poured upon them, and this should be frequently changed. Each section represents a definite portion of the hemispheres, and its location in the brain can be accurately determined at any time. If large macroscopic sections are desired, the procedure of Bramwell will be found most convenient. (Brain, Vol. X.)

Hardening Media for Microscopic Work.

In selecting the various methods of hardening for microscopic work one must predetermine what agents are to be employed for the staining processes. *Alcohol*, for instance, is not well adapted to many formulas besides that of Nissl, and for some nuclear stains. *Chrome Salts*, while more generally applicable

for a considerable number of stains, are not suitable to others, and accordingly it is better to place our pathological material in several rather than in one agent, to insure a sufficient supply in case of failure of one reagent to properly stain. Half decomposed material should never be used for microscopic purposes, it is never satisfactory and often leads to false conclusions.

Bichromate of Potassium.—This chemical alone, or in combination with other salts, is more applicable to general nerve microscopic work than any other single salt one has at command. Bichromates of ammonium, lithium and other metals are occasionally recommended, but possess no advantage over the less expensive potassium salt.

The best combination of the potassium bichromates with other salts is the well-known and universally used *Müller's Fluid* in the following formula:

Kalium bichromat	2 parts.
Sodium sulphate	1 part.
Dist. water	100 parts.

The most essential thing to remember in using Müller's fluid is to always use a relatively large quantity of fluid to the size of the specimen, to renew frequently, and to turn the specimens daily if they are at all large. If the portions of the brain are small they may be suspended in the liquid, or if larger, laid upon cotton. To insure proper penetration they should never be more than 2 cm. in thickness, and the thinner they are the better. Usually it takes from three to four weeks to harden specimens in this fluid to a proper consistency for section cutting, but in a warm chamber, at blood-heat, the same end may be accomplished within ten days, but it requires more frequent changes of the fluid. To prevent the formation of mould in Müller's fluid a small piece of thymol or camphor may be added to each jar. If the chemicals used are pure, and dissolved in recently distilled water, there is little danger of mould-formation.

The *Erlicki Fluid*, with sulphate of copper replacing the corresponding salt of soda, is not to be recommended, on account of the deposit of copper salt in the tissues and the great difficulty in removing the same.

Formol has within the past few years become one of the most

important means of hardening pathological preparations of the nervous system. For finer work it is not equal in many respects to alcohol or the chrome salts, but for ordinary pathological examinations it answers every purpose. It may be used either alone or in combination with alcohol to avoid over-swelling, or with Müller's fluid (equal portions of a ten per cent. solution and Müller's fluid) for stains that do not admit of use with alcohol. Five to ten per cent. solutions are ordinarily in use; too much of the formaldehyde does not answer, too weak solutions distend the tissue too greatly. After-hardening of formol preparations may be made equally well in alcohol or in Müller's fluid, but in the latter case it is advisable to have the sections of tissue thin, and to allow them to remain in the chrome salt solution for at least one month.

All dyes that tinge alcohol preparations will act equally well with formol. Thoroughly dehydrate the preparations before cutting into microscopic sections, and moisten the knife with 95 per cent. alcohol. Formaldehyde answers perfectly well for the important Nissl methods, for the Weigert myelin stain, after immersion for weeks in Müller's fluid, and also, after this treatment, for the Marchi method, for thionin, and even for the complicated neuroglia staining of Weigert, after appropriate treatment according to his formula. It may replace osmic acid for the Golgi-Cajal stain, though the impregnation of the nerve cells has always seemed to the writer of a coarser type than when osmic acid has been used. *Marina's* method of hardening (Neurol. Centralblatt, No. 4, '97), has the advantage that the tissues set quickly, and may be used either for the Weigert hematoxylin or Nissl method. The receipt is:

Alcohol 90 per cent.	100 cc.
Formol 40 per cent.	5 cc.
Chromic acid	10 cgrm.

The last reagent is to be added while stirring constantly, and the whole is allowed to stand some hours before it is used. Change the fluid on the second day, and thereafter every five days. The pieces of tissue are now stuck to a cork and immersed in 95 per cent. alcohol for several hours. Sections are made under strong alcohol. For the Nissl method they are immersed

in methylin blue solution for twenty-four hours, and treated afterwards according to that formula. Thionin may be substituted for methylin blue with equal results. For the Weigert coloring the sections come from the 96 per cent. alcohol into Vassale's modified copper solution (see Special Methods of Staining), in which they remain for twelve hours, are then thoroughly washed, and are placed in the lithia-hematoxylin solution in the warm chamber for twenty-four hours. Decolorize according to the usual method, to be later referred to under section "Special Methods of Staining."

Ethyl Alcohol is in frequent service in hardening portions of the nervous system. Alone it is not well adapted to the peripheral nerves, but is much used to harden portions of the brain and cord in special methods of staining. The object is placed first in 70 per cent. alcohol solution, then after one or more days it goes into 80 per cent., then 90 per cent., where it may remain until needed. For nuclear stains, the Nissl method, thionin, hematoxylin, and carmine, especially staining in bulk; very handsome and instructive preparations may be obtained from alcohol alone.

Bichloride of Mercury solutions are seldom used for pathological work.

Methods of Fixation.

The difference between hardening and fixing is one of rapidity only, but this is in itself very important. In hardening we hope to secure an equal penetration of the fluid into the tissues, slowly or with moderate rapidity, but in fixation the aim is to set the tissue with the utmost rapidity, to insure the preservation of the cell contents in a condition as close as possible to what they were at the moment of death. Thus fixation is used for the demonstration of nuclear figures, in preparations to show the granulated and striated contents of the cell protoplasm, or for the dust-like grains located in the karyoplasm of the nucleus. Naturally we are not often able to obtain preparations from the human subject in the same fresh state that we can from one of the lower animals, though even in the first instance fixation is useful to determine certain conditions of cellular structure.

Osmic Acid, in from 0.5 to 2 per cent. solutions, is in frequent use with the peripheral nervous apparatus, both for fixation and

hardening. The duration of the exposure of the nerve teased, or in section, should be as short as is consistent with proper staining, and the quantity of the fluid used should not be too small. Nerve bundles may be allowed to remain over night in weak solutions. Osmic acid is more frequently used in combinations with other tissue-hardening chemicals than alone. One of the best of these is the mixture known under the name of *Flemming's Solution:*

Chromic acid sol. 1 per cent.....	15 parts.
Osmic acid sol. 2 per cent.....	4 parts.
Acetic acid glacial.....	0.5 to 1 part.

The objects to be hardened should be very thin, not more than 2 mm., and should remain in the fluid from 12 to 24 hours. They are then washed slightly in water, then go into 70 per cent. alcohol, changed and increased to 96 per cent. Sections should be made within a few days. The method is applicable to hematoxylin, safranin, carbolic fuchsin, methyl violet, and some other of the anilines.

The modification of the chrome-osmium-acetic acid mixture, known by the name of *Fol's Modification,* has some advantages over the above method in that the penetration into the cerebral tissue is deeper, and equal care in removing the specimen from the fluid is not so necessary. It is composed of:

Superosmic acid solution 1 per cent.	2 parts.
Chromic acid solution 1 per cent.	25 "
Acetic acid solution 2 per cent.	8 "
Dist. water	68 "

Preparations are hardened in from 24 to 36 hours, and are then treated as above. If the solution becomes cloudy during the fixation it should be changed. The change to alcohol is either direct or after previous washing.

Absolute Alcohol is a most convenient means of fixation. The tissues are quickly and evenly penetrated by the fluid, and the tissues so fixed answer for a variety of staining processes. Alcohol is essential to the Nissl magenta and methylin blue processes, and for many nuclear stains. A good consistence for the finest sections is obtained within two or three days, and the

cutting should not be delayed, if the best results are wanted, as the alcohol soon removes a portion of the fatty substances from nerve tissue. The objects to be fixed should be suspended, or the bottle should be half filled with cotton and the specimen laid upon it. Absolute alcohol being of less specific gravity than that containing water, the result is that when the water is absorbed from the tissue the heavier alcohol sinks to the bottom, and the nearer to the surface the block of tissue is placed the sooner will it become dehydrated.

Examination of Fresh Tissues.

It is comparatively seldom that it is necessary to examine fresh portions of the central nervous system for pathological aims. Occasionally a tumor or softening of the cerebral substance may be found at an autopsy where it is desirable to make an immediate and rapid examination. Then frozen sections are the most desirable method of treatment, the sections to be afterwards treated with formol in dilute solution, and stained with hematoxylin and eosin (Cullen). In certain cases where it is desirable to ascertain the condition of the neuroglia, a cold 1 per cent. solution of nigrosin or aniline blue-black may be used. Teased preparations of the brain or cord are not very advantageous. The tissue should be macerated for some hours in 30 per cent. ethyl alcohol, or in very dilute methyl alcohol and glycerine (Schiefferdecker), or in diluted formic acid. They may also be placed in alum or borax carmine, metlyl blue, or even picrocarmine, for several hours to a day, and then torn to pieces with needles, or, when very small, flattened under a cover-glass. This last method permits of a better view of the fine blood-vessels than could be otherwise obtained. The addition to alcohol of a few drops of 1 per cent. chromic acid solution helps to render staining less diffuse. Peripheral nerves may be macerated in dilute solutions of osmic acid for 24 hours in the dark to detect changes in the myelin sheath, but some of the fixation methods with chromic acid, and cutting the bundles into fine sections with differential staining, present many advantages.

Methods of Imbedding for Section Cutting.

After the specimens have passed through any of the above methods of hardening or fixation, and have been thoroughly

deprived of the inherent water, it is necessary to imbed them in some material, non-resistant to the knife, which will at the time serve the double purpose of holding the tissue to pieces of wood or cork and give them some support when meeting the edge of the knife. Another object in imbedding must sometimes be kept in view, the saturation of a very soft or friable object with a material that will harden in alcohol and form a coherent mass and yet may be removed when necessary without injury to the section. For these purposes the ordinary *Celloidin*, dissolved in equal parts of alcohol and sulphuric ether to form a thin syrupy fluid, seems best adapted. Customarily, with preparations of the cortex or pons, the celloidin hardly penetrates at all into the tissues, and it is only necessary after placing the thoroughly dehydrated object in a celloidin solution for from a few minutes to an hour, to set it on a cork and allow the celloidin to dry in the air until fairly firm and then place it in 80 per cent. alcohol for an hour or two. Cooling the jar containing the diluted alcohol and blocks of tissue, under a stream of water, makes the celloidin harden much more rapidly than at the room temperature and saves much valuable time. When the preparations are very friable it is better to have two jars of celloidin on hand, one very thin, the other of greater consistency. After the specimen has been several days in absolute alcohol it is placed in the thinner fluid for one day, or even two or three days, then in the thicker, and afterwards it is placed on a cork and cut. The whole process has the following stages:

1. Dehydration of the tissue in absolute alcohol.
2. Placing in thin and thick celloidin.
3. Sticking on a cork and immersing in 80 per cent. alcohol.
4. Cutting the sections under 90 or 95 per cent. alcohol.
5. Staining.
6. Washing thoroughly in water or alcohol.
7. Dehydration.
8. Clarification in ethereal oil and zylol.
9. Imbedding the section in balsam under a cover-glass.

Celloidin has marked advantages over the gum arabic sometimes used to fix the object to the cork, and may be used in the same way, always allowing it sufficient time to dry in the atmosphere before immersion in the diluted alcohol.

Except for some special methods and for serial sections, the *Paraffin Method* has no advantage over celloidin, and the continued heat used in the process is a serious disadvantage to delicate tissues. The portion of the nerve substance to be imbedded, after having been thoroughly dehydrated in alcohol, is placed in zylol or turpentine containing paraffin, where it remains until permeated by the fluid. It is then placed in molten paraffin for from two to twenty-four hours, until penetrated, but the shorter the time it remains exposed to heat the better. This paraffin should not have a melting point above 108° to 110° F. After the penetration is completed the block of tissue is set in a mould or in a paper box, the melted wax poured around it and allowed to cool. The block may afterwards be reduced to a convenient size by cutting away the superfluous paraffin with a heated knife. Sections which are to be cut without moistening the knife have, in case they are already stained, the paraffin removed by zylol, cleared in carbol-zylol, and mounted in damar or Canada balsam; or when the sections are still to be stained, they are brought from the zylol into alcohol, and from this into the selected staining medium.

The *Freezing Method* of section-cutting possesses no advantages over celloidin, and is not often used, except as before mentioned, for the examination of fresh tissues. Either alcohol or chrome preparations may be used, but the former should be thoroughly soaked in water before the freezing process is begun.

Clearing in Ethereal Oil and Imbedding in Balsams.

After the sections of tissue have been dehydrated in absolute alcohol it is necessary for the proper definition under the microscope to clarify them in ethereal oil of some kind. Bergamot is the best for every-day use; origanum and cajeput oils are efficient substitutes. None of these oils dissolve celloidin nor act to any extent upon the aniline colors. Oil of cloves dissolves celloidin and acts more energetically upon coloring matters. Zylol is often useful, and is required by some formulæ. Creosote and carbolic acid are inefficient substitutes for the oils.

Canada Balsam in zylol answers every purpose of ordinary imbedding. *Damar Lack* remains clearer than the balsam.

Imbedding in glycerine, or glycerine containing a trace of

formic or acetic acid, answers for fresh specimens, or *Farrant's Solution* (pure gum arabic dissolved in glycerine and concentrated solution arsenious acid) may be successfully substituted. Carmine and hematoxylin preparations preserve their colors perfectly in this medium.

Methods of Staining.

We now reach one of the most important parts of microscopic technique—the staining of the hardened tissues. While it is true that unstained sections at times may give sufficient definition between the component elements to enable one to determine the outlines between them, and to a certain extent the cellular contents, yet such a procedure is usually insufficient to enable one to clearly see the finer alterations of the nucleus or protoplasm in pathological conditions, and one is obliged to use selective stains for this purpose. Stains are either diffuse or selective, and in accordance it is often desirable to choose a combination of the two, the well-known eosin-hematoxylin stain offering the best example of a selective and diffuse stain, the eosin coloring all the different tissues, the hematoxylin selecting the nuclei.

Simple Stains.

Hematoxylin is probably the most valuable of all staining agents to the neuro-pathologist, and, as it is selective, it is ordinarily used in combination with one or other of the diffuse stains, carmine or eosin, and in fact there is no stain so applicable for general purposes as this latter combination. Hematoxylin preparations should never be mounted in glycerine if it is desired to preserve them for any considerable length of time.

Delafield's Hematoxylin is one of the very best of these stains in general use for preparations of the nervous system. It has the great advantage that it may be made to stain slowly or quickly, as desired, according to the degree in which it is diluted. As a rule several hours should be allowed to elapse before the preparations are removed from the solution, to obtain perfect nuclear staining.

To prepare it, one gram of crystallized hematoxylin is dissolved in 5 cc. absolute alcohol and allowed to stand in the dark for

several days. This is added to 100 cc. saturated solution of ammonia alum, stirring constantly. After standing three or four days in an open flask the fluid is filtered, and to it are added 50 cc. each of methyl alcohol and pure glycerine. Filter again after standing a day and seal for future use. It is customary to allow the resultant liquid to stand in the dark for several months before using it for staining purposes.

For over-night staining it should be diluted with water until it is a light violet, and the sections, thoroughly washed in water, are placed in it. Quicker tingeing—one half hour—may be had by immersion in much less diluted solutions, but the beautiful blue-violet nuclear staining is not so sharp as by the longer method.

Boehmer's Hematoxylin is a much quicker staining preparation than the foregoing one. Separate solutions of a 10 per cent. hematoxylin crystals in absolute alcohol and a 1 per cent. solution of potash alum are to be prepared some days before they are needed. Sufficient of the hematoxylin is added to the alum solution to produce a fairly deep violet, and the flask is left exposed to the light for some days, during which time the color will darken considerably. It is now ready for use. If over-staining takes place the solution should be diluted. The procedure for section staining with this hematoxylin is:

1. Thorough washing of the sections in water.
2. Staining from two to four minutes.
3. Thorough washing in distilled water for several hours.
4. Gradual dehydration in alcohol.
5. Clarification in bergamot, origanum oil or clove oil to remove celloidin.
6. Mounting in Canada balsam.

Sections coming from Boehmer's hematoxylin into water darken considerably, and on that account should not remain in the fluid over-long. Over-staining may be remedied to a certain degree by washing in weak alum solution and then in water. Exposure to acids should be avoided. The nuclei are stained a deep blue, the protoplasmic substance is slightly or not at all tinged.

Ehrlich's Acid Hematoxylin is often useful when the tissues

have been long in Müller's fluid or the chrome salts. Two grams of hematoxylin are dissolved in 100 cc. absolute alcohol, and to this are added 100 cc. of each distilled water and glycerine, and the mixture is shaken frequently. To this mixture 6 cc. glacial acetic acid are slowly added, and afterwards an excess of alum. At the end of a few hours the resulting liquid is filtered, and then exposed in a flask to the light for three weeks. The further procedure is the same as by the last receipt. Nuclei are tinged deep blue, the protoplasm a light blue.

Carmine Solutions are much less used than formerly in staining the nervous system. For sections of the spinal cord, giant cells of Betz, or for the peripheral nerve bundles, to tinge the axis cylinder, it is very serviceable, and the resulting preparations are far more durable than those prepared with the aniline dyes.

The writer has found the *Borax Carmine of Grenacher* the best for these purposes, but to insure success a very fine quality of carmine must be used. Two hundred cc. of a 1 per cent. solution of sodium biborate are thoroughly boiled with one-half to two grams of carmine, and to the cooling fluid diluted glacial acetic acid is added until it assumes a dark red color. After cooling a portion of the carmine will be precipitated, and upon standing over night the supernatant fluid should be decanted, when it is ready for use. After long standing more carmine will be precipitated, but the solution retains its fine staining qualities until it is of a straw color, and especially is this true for the axis cylinder. For sections out of absolute alcohol, the duration of the immersion in the staining fluid should not be more than fifteen to thirty minutes; for the chrome salts hardened tissues the sections may remain over night. After removal from the carmine fluid wash in 1 per cent. hydrochloric acid alcohol, dehydrate, clarify in bergamot or clove oil, and mount in balsam, or glycerine and Farrant's solution may be used.

Over or diffuse staining may be remedied by keeping the sections for some time in the acid alcohol. The nuclei should be stained a brilliant red, the protoplasm less deeply, the neuroglia nuclei are well defined, and the axôn should be light red.

Borax carmine may also be used for staining in toto the tissues coming directly from Müller's fluid after careful washing for several days. The penetration is slow, and an occasional cut may be made to observe the progress of the staining.

Ranvier's Picro-Carmine is more applicable to the staining of the cerebral vessels than to the nerve cells. The protoplasm is stained yellow, the nuclei a brown-red. Hyaline degeneration of the sheaths of the vessels is easily detected. The formula is:

Carmine	1.0	gram.
Liq. caustic ammon.	3.0	"
Aqua destil.	10.0	"

The carmine is to be dissolved with the aid of heat, and 200 cc. of a saturated solution of picric acid is added slowly, and the whole boiled until it loses one-third of its volume. Sections out of this solution are to be washed in glycerine containing 1 per cent. hydrochloric acid, to which a little picric acid is added. Also the water used for the final washing is acidulated with picric acid, and finally the alcohol used in dehydration should contain a small amount of the same acid. Clarify in oil and mount in balsam.

Sodium Carminate staining in mass, especially for the pyramidal and Purkinje cells, affords some beautiful preparations, though the process does not allow one to study successfully the finer structures of the cells. The objects to be stained, either out of alcohol or Müller, go directly into a 1 per cent. solution, where they remain usually for a week to ten days, and are then dehydrated and cut.

The Aniline Colors can be used as a rule after formol, alcohol, and chrome hardening. In the latter case the bits of tissue are dehydrated in alcohol before cutting, and after staining are dehydrated, pass through bergamot oil, and then into balsam. Better results are usually obtained by heating the staining fluid after the sections have been placed in it to a temperature of about 150° F. than if they are allowed to absorb the dye in the cold.

Nigrosine is in use, particularly after the method of Bevan Lewis, to stain frozen sections of the brain. Solutions of from 0.25 to 0.50 are used, the duration of the staining process being from a quarter to a full hour, but over-coloring is to be avoided, as it is impossible to remove the surplus. Nerve cell bodies, nuclei, the thicker dendrites, neuroglia nuclei and processes, and the nuclei of the blood-vessels are stained blue-black. The method is not particularly useful.

Safranin and *Magenta* are two of the best aniline colors for investigation of the central nervous system. It is better always to make up a fresh one per cent. solution, place the sections in the fluid, and heat to the steaming point, then pass them directly to 80 per cent., and afterwards place them in absolute alcohol, oil, Canada balsam. Over-staining may be remedied by aniline oil in alcohol, or by hydrochloric acid alcohol, and, indeed, the latter nearly always improves the sharpness of definition. Nuclei and nuclear membranes are stained red; the cell protoplasm is ordinarily untinged in chrome preparations, but shows the Nissl granula in those out of alcohol. These methods are also useful for demonstration of the nuclei of the blood-vessels.

Methyl-Blue and *Methyl-Green*, in watery or alcoholic solutions, are not to be recommended except for the Nissl methylene-blue method.

Carbol-Fuchsin.—One to two per cent. acid fuchsin solution, to which are added a few drops of pure carbolic acid, is particularly adapted to the intimate structures of the nucleus. It also stains the protoplasm of the Purkinje cells to the ramification of the branches. This stain is well suited to Flemming preparations, and the resulting pictures of cellular structure are particularly fine.

Congo-Red is recommended by Nissl as an axis-cylinder and neuroglia stain. The hardening is in bichromate solutions; after hardening in alcohol, stain in a Congo-red solution of 0.75 per cent. strength for seventy hours. Wash the sections in alcohol for five minutes to remove excess of color, then wash in nitric acid alcohol (3 per cent.) for five or six hours; dehydrate and mount.

In *Hematoxylin* and *Eosin* for combined staining we have the most useful double stain for ordinary use, one that serves more purposes than any other, and from which better and more constant results are to be obtained than by any other method; in fact, no examination is complete without it. Stain in Delafield or Ehrlich's hematoxylin and thoroughly wash in water, then immerse for ten or fifteen minutes in a weak watery solution of eosin. Transfer directly to 70 or 80 per cent. alcohol, which will remove any excess of the dye (the sections should not remain for any length of time in alcohol, as it will remove the

eosin entirely), then dehydrate, clear in clove or bergamot oil, and mount in zylol balsam.

Special Methods of Staining.

The Nissl Method.—The material is hardened in 96 per cent. or absolute alcohol to a good consistency. The pieces of brain tissue are now immersed for a minute in celloidin and stuck to a cork. Cut under 96 per cent. alcohol into the thinnest obtainable sections. Immerse the sections in a methylene-blue solution made as follows:

Methylene-blue pat. B	3.75	grams.
Venetian soap	1.75	"
Dist. water	1000.00	"

Warm the water, dissolve the shaved soap in it, and add the anilin color slowly, stirring all the time. Differentiate in 10 per cent. anilin oil alcohol, made fresh each time it is used, and keep the sections in it until they no longer give off the blue color. Dehydrate, mount the sections on a slide, dry with filter paper, clear on the slide with cajeput oil, again dry, float benzine over the section, and mount in benzine-colophonium. The slide should be slightly warmed in the flame of the Bunsen burner to drive off the excess of benzine. All Nissl methods require the coloring fluid in which the sections are placed to be heated until bubbles of gas appear on the surface of the liquid.

The coloring is beautiful, but not very permanent. Formol preparations stain almost equally as well as alcohol.

Nissl's first method, the *Magenta*, is of very easy application, and gives most beautiful and more durable preparations than the first, but the cell structures are not so clearly defined. The writer has now sections seven years old that have lost nothing of their original brilliancy. The method is:

1. Hardening in absolute or 96 per cent. alcohol.
2. Warming the sections to the steaming point in freshly made one per cent. magneta solution.
3. Washing the stained sections for several minutes in 96 per cent., then in absolute alcohol.
4. Clearing in oil of cloves.
5. Mounting in Canada balsam.

The Nissl coloring furnishes us with a picture of the intimate structure of the nerve cell that is equalled by no other stain. The nucleus and its contents are not so well defined as by safranin and carbol-fuchsin after chrome-osmium fixation, but in the protoplasmic substance of the cell are shown certain irregularly shaped granular bodies arranged concentrically or in rows, that are now known under the name of the granula of Nissl. While it is not entirely certain that these figures are present during life, they are nevertheless perfectly constant in form and disposition in the various types of cell in the brain and spinal cord, and when deviations from these fixed forms are found they are undoubtedly of a pathological nature and warrant a complete investigation.

The methylene blue or magenta accordingly does not stain all portions of the cellular protoplasm equally, but leaves clear (achromatic) spaces between others more deeply stained—the fine-grained chromophilic granula, or particles. As already mentioned, the arrangement of these chromophilic granules is always definite, though varying in disposition according to the character of the cell examined. Thus in the olfactory lobe the arrangement is net-like (arkychromic cells), while those of the cerebral cortex and motor cells of the cord have them mainly arranged in rows (stichochromic cells). Furthermore, the various types of cell are divided by Nissl into several main groups by the varying relations of the cell protoplasm to the nucleus; thus the cytochromic cells, nerve granules, are bodies having a nucleus the size of a leucocyte with a small amount of stainable protoplasm surrounding it; karyochromic cells have nuclei of the usual nerve type but little protoplasm; and somatochromic cells are nerve bodies having a nucleus of moderate size with a considerable body of protoplasm surrounding it with a definite contour.

Besides the arkychromic and stichochromic cells there is the compound form, arkyo-stichochrome cells, found only in the Purkinje cells of the cerebellum, and the unimportant gyrochromic cells.

Our main interest lies in the somatochromic cells of the stichochromic group, comprising the all-important cells of the cortex, where the definite rod-like arrangement under normal conditions enables one to detect the slightest pathological varia-

tion. Nissl and others have recently demonstrated very pronounced changes in dementia paralytica of several types by his methyl-blue stain (Neurol. Centralblatt, 1896).

According to the most recent researches of van Gehuchten, given before the Moscow Congress, the achromatic substance between the granula does not consist solely of a simple fibrillary structure, as had been supposed by Nissl, Dogiel, Benda and others, but shows a much more complicated formation. It consists of a net-like organized mass and an unorganized substance, —the thread-like substance of Flemming,—and an unorganized portion, in which the protoplasmic net lies imbedded (interfibrillary substance of Flemming). These two substances are in direct continuation with the dendrites and axôn processes, the only difference between dendrite and axis cylinder being that in the former they are more grained, in the axôn more regular and distinct.

In this achromatic substance lie the chromophilic elements, which cling to the net-like substance, particularly at the points of intersection. Here the chromatic substance shows its customary fine granular structure. In portions of the cell the granules are accumulated in masses and form the variously shaped granulated or homogeneous forms. The varied arrangement of the granula in the protoplasm depends entirely upon the varying arrangement of the fibrillary network.

When one compares different nerve cells that belong to the same morphological type with one another, it is evident that there are differences in the staining properties dependent on a smaller or larger richness in the chromophilic elements.

Nissl in 1895 divided these varying conditions into several groups, each supposedly representing some functional state; the pyknomorphous being the quiescent, the apyknomorphous representing the exhaustion state of the cell. Van Gehuchten rightly says that these various conditions of the cell granula under physiological conditions belong to the most difficult subjects in histo-anatomy. Electric currents produce alterations of the cell contents, but the same changes may be found after section of the nerves (neck sympathetic and ganglia). More positive results have been obtained by Hodge, Mann, Demoor and Pergens, but even these are not unassailable. They, however, seem to show

that the nerve cell in a state of activity shows an increase in volume with a decrease in the number of the chromatic portions.

Within forty hours after the section of a nerve trunk, a rapidly spreading breakdown of the granula takes place (chromatolysis). This begins near the centre of the cell and progresses in every direction. The cell now increases in volume, and the nucleus wanders towards the periphery. The protoplasmic net remains unaltered. This stage lasts from twelve to twenty days, and eventually gives place to a period of restoration which progresses during seventy to eighty days to full recovery, when the cell returns to its pyknomorphous condition.

The above described cell alteration is not only to be found after section of a motor nerve, but also after ligature, after electric or chemical disturbance, and after various pathological processes, including inflammation. Restitution may take place after infectious troubles (Marinesco), but not after traumatic injury of the brain substance. The chromatolysis begins and seems most intense in all these conditions in the neighborhood of the entrance of the axis cylinder into the cell body. In alcoholic intoxications the chromatolysis is present mainly at the cell border.

Held's Modification of the Nissl stain, while troublesome, owing to the necessity of carrying the tissues through paraffin, gives most beautiful results. The sections should be very thin, and are stained in a warmed erythrosin solution for one to two minutes:

Erythrosin	1 gram.
Aq. dest.	150 "
Glacial acet. acid	2 gtt.

They are then to be washed in water, and are stained with aqueous aceton solution (1 part to 20), Nissl methylene-blue sol., equal parts, heated until the aceton odor is no longer apparent. The dish is allowed to cool, and the sections are then differentiated in a 0.1 per cent. alum solution until red, which may require only a few seconds or several minutes. They are then washed in water, and come successively into alcohol, zylol, and benzincolophonium.

The Nissl granula are blue, the intermediate substance light

red, the nuclear membrane and substance red, the nucleolus and adnuclear particles blue or violet.

Thionin in aqueous solution has been advocated as a substitute for the Nissl methylene-blue, but has no real advantage. After previous preparation as by the Nissl formula, the sections are stained in concentrated thionin solution for from three to eight minutes, the solution being slightly warmed. Sections after staining should be lightly washed in water, differentiated in anilin oil and absolute alcohol, cleared in cajeput and zylol, and mounted in zylol balsam. Preparations by this method are only moderately permanent.

A new method of *Formol-Methylene* staining by *Rossilimo* (Neurol. Centralblatt, 1897) recommends itself by its simplicity. It is applicable mainly to the peripheral nerve bundles. They are first hardened in a 2 per cent. formalin solution, which, in the course of the second day, is replaced by a 4 per cent. solution, in which the specimens may remain until they are needed. The tissues are then changed to 95 per cent. alcohol for four or five days, are stuck to a cork with celloidin, and sections are made which are stained in a 0.5 per cent. aqueous methylene-blue, heated until bubbles appear on the surface. After the fluid has cooled, the sections are removed to a one per cent. anilin-oil solution in 90 per cent. alcohol, where they decolorize in from a few seconds to a minute according to the thickness of the section. They are then washed in 95 per cent. alcohol and in absolute alcohol, and are cleared in cajeput oil and mounted in balsam. The cylinder axis is tinged bright blue, the myelin is a light blue, with the Lantermann indentations defined. The nuclei of the Swan sheath are deep blue. In old animals granules, deeply stained, appear in the myelin, usually near the Ranvier nodules. Pathological alterations of the myelin and axôn are readily detected.

Rehm's Neuroglia and Nerve Cell Stain.—The tissues are hardened in absolute alcohol, and sections are made after the piece of brain has been stuck to a cork with celloidin. First stain in a heated one per cent. methylene-blue solution for one-half minute. Take out the excess of color in 96 per cent. alcohol, and then counter-stain in 96 per cent. alcohol containing one per cent. fuchsin for fifteen to thirty minutes. Dehydrate with oil

of cloves, dry with filter paper, and mount in balsam. The nerve cells should be colored blue, the neuroglia a deep red. In pathological examples the nuclei and nucleoli are stained red in the place of the normal blue.

Ehrlich's Vital Methylene-Blue Method.—The vital method of staining nerve cell and fibre was first published in 1886, and while not at all adapted to pathological work, should be referred to as one of the most important of modern methods in experimental investigations.

A saturated aqueous solution of BX methyl-blue solution is made at a temperature of 100° F., and this solution in quantities of one to two cc. is injected under the skin or into a small vein of the animal selected for the experiment. Death follows after several injections, which should be made about twenty minutes apart.

The brain is now removed and divided into three or four pieces and these placed in a cold solution of *Bethe's Fixing Solution*, which is made from

Ammon. molybdate	10.0 gr.
Aq. dest.	100.0 "
Acid hydrochloric	10.0 gtt.

and the dish containing this fluid placed on a block of ice for twenty-four hours. The tissues are washed in running water for two hours and then go into ice-cold 80 per cent. alcohol for half an hour; afterwards into equally cold absolute alcohol, which is changed several times. From this they pass into zylol and then are imbedded in paraffin. Cut the sections, remove the paraffin with zylol, and imbed in zylol balsam.

Only the nervous portions of the tissue are stained, the glia remaining untinged.

For the demonstration of the gemmules of the nerve cells of the cortex, *Cajal* (Revist. Trimest. Micros., Vol. 9, 1896) recommends a modification of the *Ehrlich stain*.

Fresh pieces of the brain of a small animal are placed in a saturated solution of methylene-blue B, and after three-quarters of an hour are washed in salt solution, and are then immersed in

Ammonium molybdate	10.0 gr.
Aq. destil.	100.0 "
Acid hydrochloric	10 gtt.

for several hours, and the superfluous molybdate salt is removed by washing in water. The tissue is now fixed in

Formol	40.0
Aq. dest.	60.0
1 per cent. sol. platinum chlor.	5.0

for three to four hours, then washed rapidly in (0.33 per cent.) alcoholic solution of platinum chloride and imbedded in paraffin. Sections are then made and dehydrated in absolute alcohol containing (0.33 per cent.) platinum chloride, cleared in zylol and mounted in zylol balsam.

Methods of Staining the Myelin Sheath of the Nerve Fibres.

Staining of the myelin covering to the axis cylinder is one of the most important of modern methods of examination and should never be omitted in examination for pathological details. The methods given below may be applied to the peripheral as well as the central nervous system.

The Weigert Stain.

The tissues come directly from Müller's fluid into alcohol of 80 per cent. strength, and eventually into absolute alcohol, then into thin and thick celloidin successively. The sections, after being slightly washed, are placed in a saturated solution of copper acetate diluted with an equal volume of water, where they remain over night in a warm place. They are now taken from the copper solution, are washed in water for a few minutes, and go into the staining solution, which is made from

Cryst. hematoxylin	1.0 gr.
Absol. alcohol	10.0 "
Lithium carbonat.	1.0 "
Aq. destil. ad.	100.0 "

Sections may remain for 12 hours in this solution at the room temperature, or they may be stained in from twenty minutes to half an hour by heating the solution containing the sections over the water bath. The preparations now appear dark blue or

black, and have to be thoroughly washed in water to remove the unoxidized hematoxylin, and are then decolorized in a mixture of

Borax	2.0
Kalii ferricyanide	2.5
Aquae destil.	100.0

This differentiation requires from fifteen minutes to two hours. Rapid decolorization is to be preferred to slow, as then the finest fibres do not lose their blue-black color completely. After the process is complete,—when there should be a distinction between the white and gray substances,—the sections should be washed very thoroughly in water, either in a large dish or in a current from a gravity bottle. The thorough washing is a necessity to avoid the presence of a disagreeable crystalline precipitate in the tissue, which will occur unless this part of the process is thoroughly accomplished. Dehydrate in alcohol, clear in zylol or bergamot oil, and mount in balsam.

The medullated fibres appear blue-black, the cells and ground substance are uncolored, or light yellow. Counter-staining is not desirable.

It is preferable to make only small quantities of the hematoxylin staining solution at a time, as it sometimes quickly loses its staining power.

Pal's Modification.—The hardening is the same as by the regular Weigert. The sections are laid in the Weigert hematoxylin for twenty-four hours at the room temperature, or in the warm chamber for one or two hours. Wash in water to which solution of carbonate of lithia in the proportion of one part of 4 per cent. solution to 100 parts of water is added. Differentiate in 0.33 per cent. freshly prepared permanganate of potass. solution until the gray substance appears yellow, which ordinarily takes one-half a minute.

Then decolorize in

Acid oxalic	1.0
Kalium sulphite	1.0
Aquae destil.	200.0

In a few seconds the gray substance will lose its yellow color, and the white will appear blue-black. Now wash thoroughly,

and bring the sections into a strong lithium carbonate solution, again wash, dehydrate in alcohol, zylol, balsam.

Should the specimens have been for a long time in alcohol, or should they be insufficiently penetrated by the chrome salt of the Müller's fluid, the sections can be immersed for an hour in a warm solution of bichromate potassium to insure the presence of sufficient chrome salt, which is essential to complete the staining reaction. The preparations made by the Pal method are very beautiful, but the finest fibres of the cortex are usually not colored.

Vassale's Modification.—The hardening, dehydration, and section-cutting are according to the method originally devised by Weigert. The sections are stained for four or five minutes in an aqueous solution of hematoxylin, are washed slightly, and carried into a saturated solution of copper acetate for five minutes, are then washed in water, and differentiated in the ferricyanide and borax mixture. Afterwards they are to be thoroughly washed, passed through the several strengths of alcohol required for dehydration, cleared in carbol zylol, and mounted in balsam. The hematoxylin solution should be made just before it is used. The method gives good results, and commends itself by reason of its simplicity.

The Marchi Method.—This method is of great service in enabling us to distinguish degenerated tracts in the cord and brain.

The tissues, cut into small pieces, are hardened for eight to ten days or longer in frequently changed Müller's fluid, and are then carried into a mixture of equal parts of Müller's fluid and one per cent. osmic acid solution. This mixture should be kept in the dark. This after-hardening takes a week to ten days at a temperature of 100° F., and the fluid is to be several times renewed, and the blocks of tissue turned at the same time, to ensure better penetration of the osmic acid.

The pieces of nerve tissue are now washed for twenty-four hours in running water, are hardened in alcohol, carried through celloidin, and cut into rather thick sections. In products from post-mortems that have not been very early performed, great care should be taken to avoid crushing the nerve substance, as artifacts are readily produced.

The degenerated medullary sheaths are colored black, everything else yellow or yellowish green. Degenerated fibres in peripheral nerves are equally as well stained as those in the central nervous system.

The *writer's modification* of the Weigert stain is applicable equally to the central or peripheral nervous system, and the finest medullated fibres of the cortex are fully stained. The portions of nerve tissue chosen for the investigation are cut into pieces 2 mm. thick and hardened in Flemming's solution for twenty-four to thirty hours. They are afterwards carried, without previous washing, into absolute alcohol, which is twice changed in the following day. If by this time they have acquired sufficient consistency to admit of very thin sections, they are placed in celloidin, in ether and alcohol, for 12 hours or longer, and are cut under 95 per cent. alcohol. The sections are carefully but quickly washed in water, and laid in a saturated solution of copper acetate, which should be heated on the water bath for twenty minutes to a half hour at a temperature of 100° to 110° F. After cooling, the sections are quickly washed in water to rid them of the superfluous copper, and are then placed in the staining solution, which, as it does not keep, should only be made as needed. Fifty cubic centimetres of distilled water are thoroughly boiled, and to it are added 2 cc. of saturated solution of lithium carbonate, and the boiling continued one minute longer, and then 1.5 to 2 cc. of a 10 per cent. solution of hematoxylin in absolute alcohol is added, little by little, with constant stirring. The flask is now well corked, and when cool is ready for use.

In this hematoxylin fluid the sections are placed, the dish set on the water bath and warmed to a temperature of 100° F. for fifteen to twenty minutes, or longer if needful. After cooling, the sections are twice washed in water, differentiated in the Weigert borax-ferricyanide solution diluted with one-third or one-half volume of water. The decolorization is rapid, and should not be allowed to proceed for more than five or six minutes, otherwise some of the finest medullated fibres will lose their blue staining. After decolorizing, the sections are washed in two waters, then go into alcohol, bergamot oil, and Canada balsam.

The finished sections have a black-brown color, showing little difference between the gray and white substances. Under the microscope, the medullated fibres, even to the finest, appear blue-black, the glia yellow, the nerve cells colorless; or in event that the chrome salts have not been completely reduced, the cells and their stouter processes are tinged brown-black. In the spinal cord the T-branchings of the nerve fibres can be distinctly determined. It is essential to the process that the sections be of great thinness in order to allow of quick penetration by the borax solution.

The Chrome Silver Methods.

The *Golgi Silver Stains* cannot be commended except under unusual circumstances as useful methods for ascertaining pathological details. The Golgi stain is extremely uncertain in reaction, is liable to produce artifacts, and should never be used for tissues that are not of the most immaculate freshness, and have not lost their vital warmth before being set in the fixative solutions. Under such circumstances its usefulness is extremely limited, and it finds a place chiefly in experimental pathological research. With all these defects the methods are perhaps the most valuable ones we have at command in histological investigations, and have succeeded in revolutionizing many of our ideas of the construction of the central and peripheral nervous systems. While under all conditions uncertain, it has the great advantage, that when results are obtained they are positive, and no number of unsuccessful impregnations can invalidate one positive result.

The *Rapid Method of Cajal* is now the one in most frequent use. Small pieces of the tissue selected are cut into slices not more than 3 mm. thick, and are immersed for forty-eight to fifty-six hours in the following solution:

Bichromate of potassium	3 gr.
Distil. water	100 cc.
Osmic acid solution 1 per cent.	30 "

About ten cc. of the solution should be used to each cc. of cerebral substance. The temperature plays an important part in the hardening process and should be constantly kept at 78° or 80° F. Hardening in the dark is not absolutely necessary.

When the tissues have acquired sufficient consistence to be cut, they are rinsed quickly in water and plunged into 0.50 or 0.75 nitrate of silver solution, and after a few minutes the silver solution should be poured off and renewed. Ordinarily the reduction of the silver salt upon the nerve cells takes place in from thirty-six to forty-eight hours, and if it should be inconvenient to cut at that time, a small additional amount of the silver fluid should be added, as the precipitate is removed from the nerve cells by plain water.

The bits of brain or spinal cord should now be dehydrated in alcohol for a few minutes, stuck to a cork with celloidin, or set in a block of half-melted paraffin, and the tissue cut under 95 per cent. alcohol. The sections, which should not be too thin, are rapidly dehydrated in several baths of alcohol, cleared in origanum or bergamot oil, the excess removed with filter paper, and mounted without cover-slip in zylol balsam. If the balsam, after drying, should not completely cover the section, a second layer of a thinner variety can be applied, which will remedy the defect.

The best results with the silver method are obtained with embryonal tissues; those of adult animals should remain somewhat longer both in the hardening and silver solutions than fœtal animals.

The nerve bodies and their dendrites are stained a reddish brown or black, the neuroglia reddish black, the axôn a red-brown. The vessels, which are often numerously impregnated, to the detriment of the preparation, are dark red or black. Fine and coarse precipitates often disfigure the preparations and lead to errors in deductions.

The writer's *Silver Phospho-molybdate Modification* gives a more constant staining of the lateral buds or gemmules upon the dendrites of the pyramidal cells than the above method. It also has the advantage that the tissues can be hardened in Müller's fluid and kept in it until needed, while the rapid silver method necessitates the treating of the tissues immediately, lest they may over-harden. The precipitate, too, is not so constant; indeed, sections are often obtained entirely free from it.

The portions of brain tissue chosen for the purpose of examination must be absolutely fresh to avoid artifacts; are cut into pieces not more than three millimetres thick, and hardened at

the room temperature (72°) for two weeks or longer in Müller's fluid, frequently changed. Specimens may lie in the fluid for a month or more without injury. They are then after-hardened in

Sol. potass. bichromate 3 per cent.....100 parts.
Sol. osmic acid 1 per cent..... 30 "

According to the length of time the tissues have been in Müller's fluid they remain in the second hardening fluid for two or three days, are then washed in a weak solution of silver nitrate for fifteen minutes, and then go into a staining solution of silver nitrate of one per cent. strength, to each sixty centimetres of which is added two drops of a 10 per cent. phospho-molybdic acid solution. This staining solution should be made only as needed. The blocks of brain substance remain in the one per cent. silver solution for two, three or even six days, are removed, dried with filter paper, and rapidly dehydrated in successive changes of alcohol, are dipped in a celloidin solution in ether and alcohol, placed on a cork and allowed to dry for a few minutes in the air. The cork with the specimen is then placed in 80 per cent. alcohol, and the jar containing it placed under a current of cold water or on a block of ice for twenty minutes to half an hour, by which time the celloidin should be sufficiently hardened to allow of section cutting. The sections should be cut under 95 per cent. alcohol, dehydrated rapidly, cleared in bergamot oil and the excess removed on the slide, mounted in zylol balsam without cover-slip.

Nerve cells with the gemmulæ, neuroglia, and axôns with their collaterals to the end-apparatus are stained a deep black. The blood-vessels should not stain.

The temperature of the hardening and staining fluids throughout the whole procedure should never be much above 80° or less than 72° F.; otherwise the cells will remain unstained and precipitates take place. Adult tissues do better by this method than embryonic.

Cox's Method.—In contradistinction to the ordinary chromate of silver formula, which only impregnates here and there a neurôn, this last method stains nearly all the cells in the cortex.

Small pieces of the brain substance are immersed for from two to six months in a fluid composed of

5 per cent. bichromate potass. sol.....20 parts.
5 per cent. bichloride mercury sol.....20 "
Aquae destil. .....20 "
5 per cent. chromate of potass. sol. of strongly alkaline reaction .....16 "

Sections are to be made on the freezing microtome and are then to come into a 5 per cent. carbonate of potass. solution, are washed in clear water, then quickly dehydrated, cleared in oil, and mounted in a quickly-drying balsam without cover-glass. Like the Golgi-Cajal method, that of Cox is adapted to embryonic work. The entire cell is stained a deep black.

Silver Nitrate in watery solution (1 to 400) is occasionally used for the demonstration of the endothelial lining of the blood-vessels and cement substance between epithelial cells, for example, in the pia mater. Better adapted to pathological purposes is a mixture of superosmic acid and silver nitrate mixed in equal parts of a one per cent. solution. The osmic acid hardens and stains fat-containing substances, while the cement substance and lymphatic substances are colored by the silver precipitate. The method is particularly adapted to fresh peripheral nerves.

Gold Impregnations.

Like the foregoing silver methods, the coloring of tissue with preparations of gold is most uncertain and tries the patience of the observer. Success once obtained often rewards for many failures.

Ranvier's Lemon Juice Method is perhaps in more frequent use than any other gold stain, especially for the terminations of nerve in muscle.

The object to be stained is placed in the filtered juice of a lemon for five or eight minutes, is washed in water and laid in a one per cent. gold chloride solution for twenty minutes. It is washed freely in water and placed in water acidulated with acetic acid (one drop to 25 cc.) for 24 to 48 hours, or reduced in the dark with diluted formic acid (one volume to three of water) and mounted in glycerine containing formic acid.

Arsenious Acid Gold is recommended by Golgi for the nerves of the tendons. Fresh pieces of muscle are treated with 0.5 per

cent. arsenious acid solution for a few minutes, then are passed into an 0.5 per cent. solution of gold and potassium chloride, afterwards in one per cent. arsenious acid solution, the final reduction being effected by the sunlight. They are mounted in glycerine.

The Method of Upson, while complicated, gives very beautiful results. The tissue is hardened in a 1 per cent., then 2 per cent., then 2½ per cent. successively, bichromate of potass. solutions in the dark until of good consistency. It is now washed in 50 per cent. alcohol for two or three days, changing several times, then dehydrated in 96 per cent. alcohol, changed frequently until the blocks show a green coloring, which is usually the case in from three to four weeks. After the tissue has come out of celloidin and has been cut under alcohol, the sections are placed in a mixture of

Gold chloride	1 part.
Aq. dest.	100 "
Hydrochloric acid	2 "

in which bath they remain from one to two hours. They are then washed and immersed in a 10 per cent. caustic potash solution containing a trace of the ferricyanide salt of the same base for one minute, are then washed and carried into a 10 per cent. caustic potass. solution for one-half minute, and the gold is finally reduced in a freshly prepared mixture of

Sulphuric acid	5.0 grams.
3 per cent. iodine tincture	10 "

Mix and add perchloride of iron solution one drop. Do not allow the tissue to remain too long in the acid bath. The sections now show a rose tint. Wash, dehydrate, clear in clove oil, and mount in balsam.

As a general stain for the nerve cells of the central nervous system we would recommend the use of hematoxylin and eosin, particularly the slow-staining varieties of hematoxylin, carmine-nigrosine, the methylene-blue and magenta stains of Nissl, fuchsin, especially the carbolic fuchsin, after chrome-osmium hardening for the cell contents, and the Van Gieson picric-acid

fuchsin for Müller preparations. For an oversight of the cell contours, the chrome silver methods are best. For the medullated fibres the invaluable Weigert-hematoxylin and its modifications, and the Marchi method for degenerated nerve tracts, are to be recommended. For the axis-cylinder, including those of the peripheral nerves, borax carmine, or either the Ranvier or Upson gold staining, the Van Gieson method, nigrosine, or aniline blue-black, should be used.

The neuroglia nuclei are best stained by hematoxylin or safranin, the processes of the cells by the chrome-silver or aniline blue-black after the method of Lewis, or else by the method of Benecke, which is as follows:

Harden in alcohol, imbed in paraffin, stain in watery gentian violet solution (made of anilin 10.0; aq. dest. 100). Filter and add concentrated gentian violet solution, five to ten drops. Wash, decolorize in Lugol's solution, dry thoroughly with filter paper, flow anilin-zylol (two parts anilin to three of zylol) over the sections and immerse in zylol. As soon as the section is clear, mount in balsam. The neuroglia cells and fibres are violet, and the true nervous structures are unstained.

Staining of the Blood-Vessels.

Almost of equal importance with the accurate presentation of the nerve elements is the staining of the blood-vessels' sheaths, and an inquiry into the condition of the perivascular and connected cell-lymph spaces. The connection in the adult brain between the perivascular channels of the vessels and the lymph-sac surrounding the cortical cells cannot be demonstrated with the same clearness as in the embryo (Obersteiner); nevertheless in certain regions of the cortex of the cerebellum of the adult it is manifest, and without doubt the same condition is present in the cerebral cortex.

We are at the present time, to a certain degree, ignorant of the exact mode of passage of the nutritive plasma from the blood to the brain cells, and its return, when used, into the perivascular and pericellar channels. Around the adventitia of each artery and vein of the brain lies a lymph space named from its discoverer, His. Outwardly from this space is the proper brain substance, not separated by epithelial or endothelial lining, but

having an apparent condensation of the adjacent fibres of the neuroglia in the place of a true limiting membrane. This perivascular space may be traced along the smallest arteries, along the capillaries, and eventually along the veins, the only difference being that the lymph space of the vein is narrower than that of the arterial channel. Besides these lymph channels, which are not true lymphatics in the usual sense of the word, the aniline blue-black method of Lewis and the chrome silver stains have demonstrated a connection between the perivascular channels and certain of the neuroglia cells by means of a thickened arm, which is apparently channeled and attached by a broadened foot to the margin of the space. The silver method shows in certain experimental pathological conditions, notably that produced by ricin intoxication, that these vascular neuroglia cells become notably swollen, and within the perivascular channel, at the opening of the broadened foot, there is always a quantity of cell detritus, apparently coming from the extra-vascular broken-down cellular tissue. Sometimes this detritus is mingled with degenerating leucocytes, and sometimes the white elements of the blood are absent. It is fairly presumable, under these conditions, that the vascular neuroglia cells are excretory organs, removing the disintegrating cellular particles from the yet living tissue, as in the cited cases of ricin poisoning, where the death and partial destruction of the nerve cells has been taking place at a rapid rate, yet there is present in the tissue immediately adjacent to the disintegrating cells but a limited amount of cell debris, and the sole available agency for removal is through the medium of the tumefied neuroglia cells. From these pathological facts it is presumable that under normal conditions of functional activity the plasma of the blood, after passing through the capillary walls and permeating the surrounding tissues, and in the course of time having lost its oxygenizing and vitalizing qualities, is taken up, together with the waste products of cell metabolism, by the vascular glia cells, which are located by the hundreds along the margin of the vessels, and thrown into the general return circulation by means of the channeled arms of the cells. Bevan Lewis has advanced a somewhat similar theory, with the addition that he figures the neuroglia cells attacking diseased nerve cells and feeding upon them, a function equivalent to the absorption of a

dust particle by a leucocyte, a form of activity which is hardly probable, indeed is inconsistent with their apparent function under normal conditions, which is to take up and remove waste products, not to destroy the living organism. In the pericellular lymph-sac debris is rarely found; in the capillary spaces it is rather rare. Lymphoid corpuscles are occasionally found in the cell lymph-sac, though in very small numbers.

The whole subject is one replete with interest to the physician interested in mental diseases, especially in paresis, where the stoppage of the pericellular spaces with leucocytes, fixed nuclei, and the detritus of several kinds of degenerated cells is customarily found. The outflow of the lymph from the intimate tissues of the brain in the same disease, through the thickened and choked meshes of the pia, could be studied with interest and profit, and would give rich additions to our knowledge of the pathological anatomy of the disease.

The vessels themselves may be examined either in teased preparations or in sections, where they show in transverse or longitudinal cut, according to the direction of the knife stroke.

For teasing, a small bit of the brain substance may be macerated in diluted alcohol or in weak chrome salt, or even in methylene-blue salt solution for a number of days, and then picked apart with needles. Staining with weak solutions of silver nitrate is also used for the endothelial lining, but the addition of osmic acid to the fluid, as already given, affords better results. The teasing method is more applicable to the finer capillaries than to the larger vessels.

In the sections, hematoxylin in combination with eosin gives for ordinary purposes the best differentiation between the various layers of the vessel. It can be used with either bichromate or alcohol-hardened tissues. Nissl's magenta gives a clear depiction of the endothelial nuclei, but does not show the smooth muscle cells. Flemming preparations stained with safranin or carbolic fuchsin slightly warmed, stains all the nuclei of endothelial, muscular, and adventitial layers. If the preparations are well hardened, the osmic acid contained in the chrome-osmium-acetic acid mixture will stain any fatty particles, though it is perhaps better to stain in one per cent. osmic acid for this purpose. The chromophilic particles of the nuclei are brought out in beau-

tiful detail by safranin-Flemming, and any mitosis that may be present can be observed, as well as degenerated states of the nuclei. Van Gieson's stain brings out amyloid and hyaline degenerations of the vascular walls in an exquisite manner. Solutions of picric acid, Lugol's solution, and tincture of iodine, can also be used in detecting amyloid. Pigmentation of the capillaries, hematoidin crystals and debris, calcareous degenerations and aneurismal dilatations, are shown equally well in unstained or in hematoxylin preparations. Fatty degenerations of the intima and adventitia are best determined by osmic acid, pseudo-hypertrophy of the muscularis by hematoxylin or carmine, as well as in the safranin preparations. Colloid degenerations stain intensely in borax carmine. Some of the various kinds of debris found in the pericellular spaces will not stain with any of the ordinary dyes, or take up sufficient eosin to become visible. The lymphoid cells stain with hematoxylin, thionin or methyl blue. Proliferation of the fixed cells of the adventitia is best determined in hematoxylin preparations. In the so-called fibrillary degeneration of the brain capillaries Lepinsky (D. Arch. f. klin. Med., 1897) recommends that small portions of the brain substance be macerated for twenty-four hours in a 0.5 per cent. lactic acid, washed in water and stained for twenty-four hours in picro-carmine. They are then washed, placed on a slide, and crushed by a pressure upon the cover-slip, so as to form a thin, transparent layer of the macerated tissue. The capillaries are thus brought into view over considerable stretches and can be further treated by iodine, caustic soda and other reagents.

For the vascular contents, eosin and hematoxylin, methyl-blue, thionin, and safranin may be used to bring out the various kinds of cells.

Staining of the End-Terminations of the Spinal Nerves.

Since Sherrington (*Journal of Physiology*, 1895) definitely determined that the nerves of the muscle-spindles (Muskelknospen, Koelliker) were continuous with nerve fibres passing to the posterior roots of the spinal cord, the end-apparatus of the nerves of the muscle and skin has achieved a new importance in pathological investigations, as these peculiar structures are supposed to degenerate in various diseases and to remain intact in others.

The fibres passing to and from the cord have different destinations, principally to the skin, muscle and sinew. The periosteum and bone, though supplied with medullated nerves, have not been fully studied.

The skin nerves have a variety of endings. In the stratum Malpighii they pass between the epithelial cells, and end free between them, after repeated branchings, in the form of a rounded or slightly pointed ending closely adjusted to the epithelial cell. Besides these free endings there are quite a number of interesting nervous structures lying within the substance of the cutis and the contiguous mucous membrane, of which the tactile corpuscles, together with the even more peculiar Pacinian bodies, are the most prominent examples. Nothing positive is known at present of the deportment of these bodies in organic nervous diseases.

More interesting, and better studied, are the nerves of the muscles and their relatives, the sinew spindles of Golgi.

All the end-organs naturally fall under two classes, motor and sensory terminations. The first are found, in mammalia, in several forms, the principal being a repeated division of the medullated fibre into small knob-like endings (Retzius), or the ending may be in the form of a terminal plate of rounded or Ç-like form, having a peculiar structure, the nerve fibre after losing its medullary covering spreading out in arborescent form, imbedded in a kind of granular material.

Various methods of staining these end-terminations of the skin and muscle are in service. Of these the Ranvier gold chloride method seems to give the best results. Osmic acid and picrocarmine are recommended by Homer. Maceration of the muscle in dilute osmic acid gives a fairly good preparation of the motor plates. Staining with aqueous solutions of fuchsin or safranin shows the chromatin contents of the numerous nuclei along the sheath of Henle. The Ehrlich methyl-blue stain gives perhaps the clearest pictures, but only applicable to comparative histological studies.

Sensory Nerve Terminations.—The muscle-spindles, the organs of muscular sense, which conduct to the central organ impressions of the muscular contractions (Langhans), are the most important of these structures. As a description of them is not

to be found in any text-book in the English language, it may not be inappropriate to give a short description of their histological construction. The sense-organ is a spindle-shaped body having a length of 8 to 10 mm. and a breadth of 0.1 to 0.2 mm., situated among the fibres of the striated muscles of the body (exceptions are to be noted to this rule in the ocular and diaphragmatic muscles) or in the muscle contiguous to a tendon. It has a sheath of concentric lamellæ resembling the sheath of Henle of a medullated fibre. Within the sheath is contained a number of small striated muscular fibres, the average being five to eight. At one point in these fibres nuclei increase in numbers until they completely fill the fibre, then, after a short distance, the fibre again becomes striated. Several nerve fibres having a medullated sheath, varying from two to ten in number, enter the pole of the spindle and terminate principally upon the muscular fibres and between the fibres and the sheath. There is still some doubt as to the eventual form of distribution of the nerve terminations, though it is almost certain that the form of ending known as a motor plate is absent.

Besides the nerves, the spindles are well supplied with blood-vessels and lymphatics which have their entrance and exit near the point of penetration of the central nerve. The lymphatics have their greatest development in the central region of the organ.

A number of writers have in recent years detailed the results of their investigations upon these bodies, the most important works being by Forster, Babes and Blocq, Langhans and Batten. The weight of the evidence so far collected is that when there is a lesion affecting solely the motor portion of a nerve trunk, the muscle spindles do not show any degeneration of their nerve fibres or of the muscular cells therein contained, while in lesions affecting both the sensory and motor fibres the nerves, in common with all other terminal organs of the muscle, are found degenerated, but the muscular fibres intrinsic to the spindle remain for a long time intact (Batten). Babes and Blocq, however, considered the muscle spindles in a case of myopathy to be pathological in appearance, a result that has not been substantiated by others. I append in tabular form the results obtained by two of the most accurate of recent investigators:

BATTEN.	LANGHANS.
MUSCLE SPINDLE IN	MUSCLE SPINDLE IN
Infantile paralysis, normal.	Myelitis, normal.
Tabes dorsalis, Muscle fibres, normal, Nerve fibres altered.	Muscular atrophy, normal.
Myopathy, normal,	Bulbar paralysis, normal.
Progressive muscular atrophy, normal.	Tabes, Muscle fibres and other portions of structure normal, the nerve fibres uncertain, but in all spindles examined they were present.
Peripheral neuritis, probably normal.	Cretinism, alterations in capsule, presence of abnormal deposits of mucin, changes in the connective tissue of the inner portion of the spindle.
Section, or injury to nerve trunks leads to atrophy of the muscle fibres of the spindle.	

Forster thinks the spindles are altered in myopathy.

Various methods for the demonstration of these peculiar and interesting nerve end-organs, or rather beginnings, have been used. Ranvier's, or some other of the many gold methods, have been in frequent application. Carmine and eosin hematoxylin have been employed for their demonstration in sections. The ordinary Marchi method, or Babes' modification (hardening in 2½ per cent. bichromate of potass. solution, with after-hardening in diluted Flemming at a constant temperature of 75° F. for three to four days), is useful for determining if the nerves are degenerated. Batten has found Sihler's method of staining the best suited for the spindles; a portion of fresh muscle, taken below the entrance of a nerve bundle, is taken and divided longitudinally into thin strips, or, better, frozen and cut into thick sections, and these are macerated in

Acetic acid	1 part.
Glycerine	1 "
Sol. chloral hydr. in 1 per cent. dist. water	.6 "

The tissue is to remain in this fluid for 24 hours, then is immersed in glycerine for two to three hours. The muscle fibres are now pulled apart (with the frozen sections this is not necessary) and stained for three to ten days in

Ehrlich's hematoxylin	1 part.
Glycerine	1 "
Chloral hydrate sol. 1 per cent. in dist. water	.6 "

The muscle spindles after this treatment can usually be detected by their darker staining, and the portion of muscle in which they are imbedded teased out under a magnifying glass.

Other methods, the gold excepted, require sections to be made. A simple method of staining the nerve fibres of the spindles is the following: Fresh preparations, or those already hardened in chrome salts, are carefully picked to pieces and a few drops of glycerine and picro-carmine added to the slide, which is placed in a warm chamber for twenty-four hours. The superfluous fluid is now removed and the teased tissue covered with a glass. The axis cylinder is stained a beautiful red.

The sinew spindles were first described by Golgi, and, together with the Vater organs of the tendons, have the same relation to sensation and muscular sense as the already described muscle spindles. They may be quite readily demonstrated by the arsenious acid gold method, by the Ranvier-Fisher method, and by the admixture of osmic acid and silver nitrate already given. The preparations obtained, especially by the gold methods, belong to the most beautiful in the peripheral nervous system. More work could be profitably done in this line to determine the intimate relations of the nerve endings to the sinew fibrillæ and their relation to the nuclei.

STATE CARE OF THE INSANE.[1]

By P. M. WISE, M. D.,
President State Commission in Lunacy, New York.

There is no controversy relative to the duty of a community to care for those who cannot care for themselves; neither is it questionable that the care provided shall be humane and worthy a benevolent people. It has been said somewhere that the degree of civilization in every country can be measured by the standard of its charities. If there are other more exact measurements, we have the fact remaining that our most Christian and civilized peoples give their dependents the greatest attention. And this is not wholly the result of unselfish principles, but it largely comes from the methodical tendency towards preparing for fortuitous misfortune; and the belief that as we do to others so may we expect for ourselves.

The insane are those unfortunates who can least care for themselves, and their numbers and requirements have been so extensive that not only for the welfare of the community, but for their own good, they have by universal consent been a common burden, and provision has been made for them by taxation where voluntary contributions have not been sufficient. Insanity has been the one sickness of the human race to remain unrecognized as such, long after the great enlightenment which medical science gave to the world; and even at the present time there is a lingering doubt in many a cultured mind whether demoniacal possession may not be a better explanation after all for some manifestations of insanity, than a diseased brain. These doubts, however, seldom reach expression, and we must assume a universal tacit admission that insanity is the result of disease and should be treated as such.

Well, how shall it be treated? For many centuries the insane

[1] Address before the Conference of Charities, Baltimore, November 23, 1897.

were treated as criminals. The brain was the only organ in the body which was subject to contempt when it became disordered. Even in the days of Paré, when surgery was making rapid strides, when the grosser organs of the body were being carefully studied, the subtle disorders of the brain, upon the material stability of which depends the expression of the very soul of man, were treated with contumely, and to be devoid of reason where reason was once enthroned was to be disgraced. Even now, in the present era of enlightenment, the occurrence of an attack of insanity often becomes a social barrier to the individual, however complete may be the recovery from it. If the great public would recognize insanity as a symptom of a disordered brain, which it is, and not as a disease *per se*, which it is not, it would effect a change in sentiment regarding it. It is a condition, however, recognized by all as unfitting the individual for the ordinary avocations of life, and throwing him upon the mercy of his nearest of kin, and when they are unable to care for him, upon the community at large, for proper care and sustenance. The wage-earner becomes dependent, and, when upon him rests the support of a family, we have one of the saddest sights of this serious life. It is thus that the burden rests so largely upon the community, for no other disease to which the body is subject brings with it such complete discomfiture and misery, frequently far-reaching and ending only with life. It is, therefore, unjust and unfair to class these unfortunate victims of disease with paupers and criminals. Voluntary pauperism and crime are first cousins, but dependence caused by insanity has no relationship to either. It may be, and frequently is, an incident in a blameless life. There is no equity in establishing dependence as a basis of judgment upon the insane. The State, as the largest factor of government, owes a duty to its reason-dismantled citizens, and that duty is imperfectly met when it places pauperism, crime and insanity in one classification.

It would appear from the record of the State of Maryland that this duty has been discharged imperfectly and upon the theory that an unpleasant function easiest forgotten is soonest performed. It is true that you have built some excellent curative institutions and have recently started a new one which is to be a model of its kind, but, if I am correctly informed, you have approximately

a thousand of these unfortunate human beings, your brothers and sisters in the sight of God, in your almshouses and jails, associating with voluntary paupers or criminals, without proper nursing or medical care, depending upon the wishes and the sentiment of the local keeper for quantity, quality and variety of food and clothing; and, worse than that, depending upon unskilled persons for the treatment of the unbridled passions let loose by disease, which require for their proper management a thorough knowledge of the human mind and brain. If this be true, I fearlessly say to you that you are far from being prepared for the new century, and you have no time to spare if you would enter it with a clean record. Maryland has a world-wide reputation for philanthropic work. The names of Moses Sheppard, Samuel Ready, Johns Hopkins, R. S. Steuart, Enoch Pratt, Mary Garrett and many others have brightened Charity's garment until it shines the world around. How sincerely is it to be regretted that such a medieval stain as almshouse and jail refuge for the insane should mar its brightness.

There is one feature in benevolent work that may be properly termed commercial. It is the practical question which has been largely solved by charity organization. It is, in short, the best application of means to an end. I can say without fear of successful contradiction that any State which has not taken to itself its immemorial prerogative in providing for, directing and supervising its insane wards, has neglected the commercial feature of its benevolent work. In plainer terms, I mean that it pays the State to dispense its charities methodically—by business method. Sentiment is valuable in forming and sustaining policies, but public sentiment alone, unless it is supported by an argument that appeals to the tax-paying voter, often falls short of results. And right here is where State care for the insane has the best of the argument. In using the term "State care" I do not wish to be understood as meaning the mongrel variety—half State and half local. It is not required that I call the attention of such an audience to the frequent failure of divided responsibility. No, I mean the assumption of the State's right and duty to provide for, direct and supervise the care of all the insane, all the time, and to make it a misdemeanor for a local poor officer to receive into his custody an insane person except

for transmission. It is only by imperative laws that abuses can be avoided. The State of New York has had an experience within the past ten years it would be profitable for other States to study. It is only within a decade that nearly ten thousand of its insane have been removed from county and municipal support and care to the sole care of the State. To accomplish this required a battle that has left many scars, but I doubt if the worst enemy of the movement would openly assert to-day a belief that for any honest interest there should be a return to the former system of misrule. The "local interest," so-called, will always be found against a movement towards what they term "centralization"; and what does it mean? One of the worst types of the old municipal government of New York says it means patronage and perquisites on the one hand, and this has been shamelessly used as an argument against the principle of State care. It must be granted there are honest and well-meaning objections urged against the removal of the insane from county-houses, but they are not sound and will not stand analysis. They are numerous and cannot even be referred to in the time at my disposal.

I learn from an address delivered a few months since by Dr. Edward N. Brush, to the Medical and Chirurgical Faculty of Maryland, that the conditions existing in this State to-day relative to the care of the insane are quite similar to those in New York ten years ago. You have made provision for approximately 700 out of an insane population of 3000, of which 1800 are now in custody. Thus about 1100 are supported in county or municipal almshouses or asylums. I have no fear of contradiction when I state that the care and treatment accorded to these 1100 insane is not what it should be, either under the requirements of science or measured by the dictates of humanity or the demands of the progressive spirit of the epoch.

And now, begging your patience, let me enter into this question in greater detail. *What must you do to be saved* from the ignominy of almshouse care for your insane? You have, or will soon have, two admirable insane hospitals, than which there are none better. The strong arm of the State should support and extend these hospitals to enable them to gather all of the insane now in almshouses to their beneficent care. Create a State

lunacy department and endow it with executive power; not confine it to visitorial and reportorial functions. Make your statutes so strong that a local poor officer's relation to a case of insanity will not extend beyond a period necessary to inform its district hospital of the case and give the necessary temporary care awaiting the trained nurse's arrival to take charge of it. Make it a misdemeanor for a local officer of the poor to receive into his custody any person who may be insane or mentally defective in a degree which your laws may safely define. And then in order that your taxpayer may have ample protection, place the support of your institutions upon a business basis, upon a commercial basis if you please, but make it liberal enough to be effective.

And will this liberal policy, if adopted by your State, increase the burden of the rates? I must admit I am not acquainted with the arguments that may have delayed suitable provision for your insane, but if human nature and human motive in New York and Maryland are alike, my experience leads me to believe that one of the chief claims made by the advocates of local, or county, or almshouse care is that the insane can be maintained at much less cost in county than in State institutions. In truth, we may assume that the whole case of those opposed to State care centers in this claim, for human credulity can scarcely receive any pretense that any county can do more in its poorhouse for the physical comfort and humane treatment of the insane than the State can or does do for them in its specially constructed hospitals. I have no doubt that very specious arguments may be advanced to show that an equal standard of care to that maintained in the State hospitals may be obtained in the county institutions, but it is self-evident that such a claim is unfounded. In a very careful comparative analysis of cost of maintenance of the insane under respectively county and State care in New York, in which it was quite impossible to get all the items of cost under the county system, it was shown that in thirty-two counties the tax rate for the support of the insane under the State system was decreased, while in twenty-eight counties it was increased. The average was slightly increased to the approximate equivalent of seventeen one-hundredths of a mill on each dollar of the assessed valuation of property in the State, so that

a farmer taxed upon an assessment of $10,000 would have an additional annual expenditure of one dollar and seventy cents to insure humane treatment of the dependent insane. For the past year a general tax levy was authorized by the Legislature of one and one-tenth mills for the purposes of the department of the insane of the State, and out of this appropriation must be paid the cost of all buildings constructed, of all repairs and improvements, and the maintenance in full of what is technically known as "State care of the insane."

As applied in New York, the term "State care for the insane" implies provision and maintenance for all the dependent insane of whatever class in State hospitals. The basis upon which the State hospital system is established and organized is (1) a division of the State into hospital districts; (2) each hospital to receive and care for all of the dependent insane, both acute and chronic, of its district; (3) a healthful, picturesque and accessible site, with an acreage large enough to furnish occupation and ample recreation grounds and for agricultural purposes, with sanitary drainage and abundance of water; (4) hospital buildings of a permanent character designed and arranged upon scientific principles for the proper classification of the insane of its district and equipped with modern sanitary appliances for warming, ventilating, lighting, fire protection, cooking and all the operative requirements for the safety, physical comfort and cure of its inmates; (5) a skilled, sufficiently large and liberally paid medical staff, including women physicians and specialists for the treatment of the eye, ear, teeth, etc., as well as a corps of medical internes as adjuncts to the regular staff, thus using the hospital as a means of instruction; (6) a liberal corps of skilled nurses trained by a regular course of study and practice in the schools of the several hospitals upon a well-digested and approved plan, the proportion of such nurses and attendants to the insane averaging as one to eight; (7) a liberal and varied dietary designed on a physiological basis to meet all the nutrient requirements of the patients; (8) sufficient clothing, bedding and furniture, designed and prescribed by experts; (9) the most varied and ample means for the occupation, diversion and entertainment of patients, not only to increase their comfort and content, but to be applied under skilled medical supervision for their curative

effect; (10) all medical and surgical appliances for the most recent and progressive treatment of insanity in any of its forms; (11) the selection and promotion of officers and employés in accordance with civil service principles, a permanent tenure of office during fitness and efficiency, and entire freedom from the baneful influence of politics; (12) a uniform system of medical and financial operations and records, and monthly conferences of all the executive officers of State hospitals with the State Commission in Lunacy for consultation; (13) the removal of patients from their homes or from poorhouses to the State hospital by trained nurses of the same sex, and, where necessary, accompanied by a hospital physician at the expense of the State, and a statutory prohibition of all jurisdiction of superintendents of the poor or other local officers over the insane after they have been certified as such; (14) the maintenance of a central pathological laboratory with a full staff of skilled scientists co-operating with and for all the State hospitals, and (15), finally, the whole to be under competent central supervision, having the power to correct abuses, maintain discipline, enforce economy, and the whole to be maintained by the State by means of a general State tax levied for that specific purpose.

As a result of the complete operation of this system for the past number of years, of the 21,000 insane in custody in the State of New York there is not one in a county asylum, a poorhouse, a jail or a penitentiary unless temporarily apprehended for commitment to a State hospital. There is no doubt in my mind that with the experience up to this time in the State care of the insane, it is nearly the unanimous opinion of the tax-paying members of the commonwealth that the State of New York's experiment in humanity is a success and that it pays to be scientifically humane.

In the foregoing remarks, I wish to be distinctly understood as not reflecting upon the existing Commission in Lunacy of Maryland. My contention is specifically a reflection upon the laws of Maryland, for, if I am correctly informed, the powers of the Commission in Lunacy are chiefly of an advisory character. Their public documents record their deprecation of the existing condition of the insane in this State, and their recommendations have pointed towards the creation of better provision for them.

I contend, however, that, as having the knowledge that must come to them from personal observation, they may be reasonably criticised for permitting the following public utterance to remain unrepealed: "In the opinion of this commission, no almshouse is a proper receptacle for insane persons unless it is provided with rooms so constructed as to safely detain such insane without the use of chains or ropes, for the reason that such treatment is well calculated to magnify the mental excitement of the unfortunates, and almost precludes the possibility of recovery." Until this resolution is substituted by one which substantially and emphatically declares that, in the opinion of the commission, no almshouse, under any circumstances or under any conditions, or however provided, is a proper receptacle for insane persons, it may safely be assumed they have not given the public and the legislature that advice which, as one of their official functions, may be expected of them. The fact that the State has not made provision for all the insane, and that the almshouse is the only expedient, even if a temporary one, is no excuse for the approval of the almshouse as a receptacle for insane persons; but from a supervisory and advisory body should issue at all times, and in the most public manner, appeals for the proper recognition of the claims of those whose darkened minds prevent them from urging their own. But in order to effect the best results, your commission should have more than advisory functions. It should be fully empowered and charged with the execution of the laws relating to the custody, care and treatment of the insane. It should be charged to provide the accommodations for the prospective needs of the poor and indigent insane of the State, and be held responsible for the proper execution of this duty; and then it should be supported by appropriate legislation which will enable it to execute with fidelity its fiduciary capacity as a trusted agent of the commonwealth. Must every reform depend upon an ebullition of public sentiment or public indignation? Cannot a calm, deliberate consideration reach a proper conclusion of the proper balance of the debit account of our relations and duty to our fellow-man? Then why, may I ask, should so manifest a requirement as the proper care of the insane await a general uprising before your wise men and leaders give it cognizance? We know that revivals have been necessary to effect

lunacy legislation from the time the saintly Miss Dix swept so large a surface of our globe with her irresistible appeals for mercy and relief for the insane for humanity's sake, but it is incomprehensible why it should be so, unless we admit that the insane are forgotten in the rush and hurry of life. Better, aye, a thousand fold better, that we resort to a Borgian method of lethal euthanasia for these forgotten non-producers, even if we violate a commandment, than permit them to consort and linger with the criminal and his relatives if we cannot afford to do our brotherly duty to them. Yes, either this or provide them with proper care and the benefit of all available relief measures. No middle course should be tolerated in this progressive epoch, and the demagogue's appeal to the burdened tax-payer should not be heeded, for it is delusive.

As far as possible individual effort to give aid to the care of the insane, as toward any eleemosynary provision, should be encouraged. You have in Maryland more instances where private fortunes have been devoted to the public good than perhaps any State of the Union of equal strength, if not without limitation. The recent instance is the bequest of Enoch Pratt, which is most timely, and a class, unable to pay for the full cost of their maintenance and treatment, still desiring to retain that modicum of independence which comes from partial support, and having absolutely no retreat, will thus be amply and beneficently provided for. All the dependent insane are indigent, as distinguished from sane dependents or voluntary pauperism, but the public hospitals have a full budget in carrying out any provisions that may be created by the legislature looking to State care. The Pratt legacy, therefore, combined with the Sheppard bequests now in such successful operation, will prove a valuable adjunct to State care, and give Maryland what seems desirable for any State—provision for the partially indigent insane.

There are many questions relative to the kind of provision which the State should make for its insane, but they are quite subordinate to the great fundamental principle of "State care." When this is firmly established by statute, and if possible by constitutional provision, then the important but minor question of how the State shall proceed to discharge its trust may be undertaken. It would seem that your present complete hospital

organizations are sufficient to carry into effect the primary movement of State care. In New York it has been found, after a hospital organization is established and the operative plant is equipped, that subsequent accommodation can be added at the rate of five hundred dollars per capita, including complete equipment. Upon this basis a half million of dollars would enable Maryland to remove all her insane now in almshouses and jails to State institutions, and the subsequent provision for the annual increase of the insane would be a comparatively small consideration. By appropriate designs, having in view a classification of the entire insane population of a defined district, a large community can be ministered to without embarrassment and with positive advantages over the small asylum. Classification can be made more complete. The various diversions and occupations for the insane can be increased to meet the needs of a larger variety of cases; and by segregate construction, the whole can be as harmoniously administered as any well-to-do and prosperous village of equal size. The State hospitals of New York vary in census from 500 to 3500 in single communities. The advantages of a hospital of 2000 and over are quite apparent, and the smaller institutions lack a diversity of features that it is possible for the larger institutions to enjoy, although they may not be absolutely requisite for the well-being of the patients.

A feature of custodial care of a proportion of the insane under public supervision, as now practiced in Scotland and in the State of Massachusetts, is worthy a reference. It is the placing of the harmless and able-bodied insane, who are partially able to support themselves by labor, but unable to do so except under supervision and direction, in families willing to undertake their care and support for a small return. This in Scotland is known as the "boarding out" system, and eighteen per cent. of the total insane population is thus provided for. In Massachusetts the number provided for in families is approximately 150, and is annually decreasing. It cannot be doubted that in Scotland, where family care has been practiced successfully, the public has been relieved of a considerable burden. Success in an equal degree has not been attained in Massachusetts, although at one time an earnest effort was made in its behalf. New York has been unwilling to lend its aid to this experiment, for the ostensi-

ble, if not the nominal purpose of the State in assuming the care of its insane, is to give them that observation and treatment which sick and irresponsible people require, and which insane persons may require unexpectedly and without premonition; hence they should be at all times within the reach of skilled aid. It is not in the power of man to tell when a diseased brain may break from its apparently permanent but abnormal moorings and launch the individual in irretrievable disaster. It has been maintained that the insane are sick and irresponsible, and if they are it is the duty of the State to give them the benefit of appropriate care and treatment, and if they are not, their care can safely be left to other eleemosynary provision.

In the sixth annual report of the State Commission in Lunacy of Maryland I find reported, at the close of that year, 1781 insane in custody, including those in the almshouses. In the eleventh, which I believe is the last report of the Commission, it is stated that the number of insane persons confined in different institutions, including almshouses, is 3105, of whom 378 are colored. This enormous increase in five years, approximating seventy-five per cent., is quite incomprehensible, and I am inclined to be skeptical regarding the correctness of the reports. This increase is mentioned because it would be reasonable to expect that if the State made adequate provision for the insane, many that are now kept in families because their friends are averse to having them detained in almshouses, would emerge from their hiding-places and would receive the care which their condition required. Under such circumstances an increase in the number in custody might be reasonably expected. Under the present conditions it is inconceivable that any family, however destitute, would willingly submit to the removal of their kin to an almshouse. It matters not whether separate buildings are constructed for the insane and are called asylums. As long as they remain under the unit of county government a proper separation of classes cannot be effected. The strong arm of the State must support its mentally defective wards, and the experience of years has shown that no lower unit of government than the State has ever been able to effect it. Not only provision for this class is needed, but a correction of your laws with reference to the insane—their commitment, detention and release from custody, increasing the

powers and responsibility of your central lunacy department, and clearly defining them.

In the State of Maryland to-day, if I am correctly informed, the iron handcuff or chain is in use, fetters which were stricken from the insane in France by Pinel more than a hundred years ago. Of the approximately one thousand insane in these receptacles, which for the insane are remnants of a past age, there are only fifty paid persons who directly or indirectly are engaged in their personal care. In twelve of eighteen almshouses in which insane are kept, I learn from their reports there are no nurses or attendants except those obtained from other inmates. Of these more than nine hundred insane, seventy-four, or more than eight per cent. are subjected to mechanical restraint, and forty-one, or about five per cent., are maintained in solitary seclusion. According to the reports of your Commission, there have been insane persons in your jails continuously for the past five years suffering from a form of insanity which is universally recognized as requiring the most careful and judicious treatment.

Arouse yourselves, sons and daughters of Maryland! Sweep the cobwebs from your statute books, remove this stain from the otherwise fair fame of your progressive State, and let future generations know that from this year began an appreciation of the proper relation which should exist between the whole-minded and free-willed and those whose mainspring of life is broken.

MEDICAL EXPERT TESTIMONY IN THE KELLEY MURDER TRIAL.[1]

By WALTER CHANNING, M. D.

It has been so often the province of the alienist who has testified as an expert in a trial to find cause for criticism in the way his testimony has been presented and utilized, that it is with a feeling of the greatest satisfaction the writer can say that in the case under discussion there could be no just ground of complaint. On the contrary, the experts' opinions were received with respect and consideration, and exerted an important and considerable influence in determining the final issue of the case.

The precedent of the proper method of introducing medical expert testimony in a murder trial, which this case may be instrumental in establishing, is of such value and interest that the writer will undertake to present a somewhat detailed account of the medico-legal aspects of the case.

The circumstances of the homicide were these: Shortly before two o'clock on the afternoon of April 16th, 1897, the dead body of Joseph A. Stickney, cashier of the Great Falls National Bank of Somersworth, New Hampshire, was found on the floor of the bank. Death had been undoubtedly produced by numerous blows on the head, some of which had crushed the skull, and by cutting the throat from ear to ear, evidently with a razor; a black-jack or billy was found near the body, which accounted for the blows on the head.

The vault had been rifled of nearly all the gold and silver it contained, amounting to several thousand dollars, and a valuable package of stamps, the property of the postmaster, was missing. No bonds or stocks had been molested.

Suspicion quickly pointed toward Joseph E. Kelley, a young man who had lived for several years in Somersworth and the

[1] Read at a meeting of the Boston Medico-Psychological Society, December 16, 1897.

town of Berwick across the river. Three days afterwards he was arrested in Montreal and made a frank and full confession of the crime.

The cashier of the bank was an old and somewhat feeble man, seventy years of age, respected and esteemed by those who knew him, and his brutal murder aroused the indignation of the community and a strong feeling of hostility toward the murderer.

During the summer following the crime, experts were engaged by the counsel for the prisoner to examine into his mental condition, which led to the employment of others by the State for a similar purpose. This procedure was rendered peculiarly necessary in the case under discussion, as the law of New Hampshire specifies that " where insanity is set up as a defense to an indictment, the jury must be satisfied beyond a reasonable doubt that the killing was not produced by mental disease."

The experts selected by the State were Drs. Edward Cowles, George F. Jelley and the writer, and they made several prolonged examinations of the prisoner in the county jail at Dover. Under ordinary circumstances it would have been desirable to have visited him singly, as well as in a body, thus seeing him under the most varied conditions. The prisoner's counsel, however, preferred usually to be present themselves with one or all three of their own experts. This resulted in a combination investigation, which, while it eliminated the disadvantage of a possible personal bias on the part of the investigator, did away with the accuracy and exactness resulting from a close and continuous investigation along one single line. Often a man in the presence of a dozen other men is quite unlike the person wholly alone with one other man. In a multitude of counsellors there is sometimes safety for him who is seeking to *escape* the consequences of their counsel, as well as for him who seeks to gain advantage from it.

The situation with Kelley then was this when the experts for the State first saw him: he had previously seen his counsel and some of the experts employed by them a number of times, and had acquired a familiarity with their system of probing and sounding him for evidences for and against mental unsoundness. While he could form no idea of their precise purpose, it was possible for him to gain a facility in responding, and it happened

that he had the ready and quick perception which materially helped him in accomplishing this purpose. Thus it was that we found him ready and alert in answering innumerable questions, and the writer felt that he had so many times rehearsed most of what he had to say, that without in any sense feigning a part, he had come to use instinctively whatever his agile wit enabled him to pick up as something coming quite spontaneously from himself. It appeared that he was able to manufacture lies where truth would not serve, and he had become a composite of Kelley plus, not only his counsel and the alienists he had seen, but newspaper reporters, detectives, fellow-prisoners and most of the persons he had seen since his arrest. It will thus appear evident that it was no easy task to analyze satisfactorily such a mental conglomeration, especially in the presence of a large number of both friendly and hostile inquisitors.

The better to understand the man we were called on to thus examine, it becomes necessary to describe his appearance physically and mentally. His measurements were as follows: Height, 5 ft. 4½ in.; weight, 170 lbs.; length of head, 190 mm.; maximum width head, 146 mm.; minimum width head, 122 mm.; horizontal circumference head, 555 mm.; length face, 132 mm.; width face, 120 mm.; width between eyes, 26 mm.; length orbit, 34 mm.; length nose, 56 mm.; width mouth, 49 mm.; width jaw, 115 mm.; cephalic index, 76.31+; length left ear, 59 mm.; width left ear, 30 mm.; angle left ear, 50°; length right ear, 58 mm.; width right ear, 31 mm.; angle, 50°. The palate (see Plate I) was a little higher and longer in proportion to the width than normal. Parallelism of the alveolar processes was a striking characteristic. Teeth were regular and comparatively sound.

While the measurements of the head reveal no striking abnormality or asymmetry, there was a slight flattening on the right side in the parietal region and parietal depression of a congenital character on both sides. About the middle of the left frontal bone there was a small cruciform scar, and under it a depression rather smaller than the end of the little finger, which could be seen as well as felt.

The type of head was medium dolicho-cephalic; in appearance, however, brachy-cephalic, but not in reality, the pompadour cut of the hair making appearances deceptive; thus the hair

standing up straight in front two or three inches high made the forehead appear higher than it really was. The accompanying outlines of the head give an approximately correct idea of its contour (see Plate II).

The hair was dark and rather coarse.

The eyes were brown and tending to the almond type. The skin was clean and smooth. The arms and legs were well proportioned; the hands rather large for the body. The general appearance was of physical symmetry and the roundness and plumpness of the young boy or girl. The color was bright and fresh and ruddy enough to suggest perfect health.

Coming now to a description of what we may call "psychophysical characteristics," the facial expression deserves special mention. No correct idea can be formed of it from the accompanying picture (see Plate III). There was something attractive and winning, almost fascinating, about it, which was very much enhanced by a smile lighting up the whole face. It was easy to get an impression of ingenuousness and even innocence, in spite of his evil deeds, as one looked into his face. There were no furrows, no suggestions of hardship, suffering or sorrow in any facial lines; nothing but a broad, flat, round visage with the happy look of untroubled youth. The mouth was rather small, the lips thinnish, the lower jaw somewhat heavy. A subtle look of cunning now and then could be detected; but it was the negative character of the expression, as far as any betrayal of emotion was concerned, that struck the writer's attention. There were no evidences in the face that anything in life had so far reached down below the surface. There were indications of coarseness and lewdness to be observed on a very close inspection, but not to a sufficient degree to mar the general effect of good-natured boyhood.

As Kelley faced the various experts and others grouped around him, most of them note-book in hand, it might be thought that the situation would have been an embarrassing one, considering the gravity of the situation for him, but the embarrassment was on the side of the experts, rather than on Kelley's side. He carried himself with such self-complacency and answered all questions with such ready frankness that for some time it seemed as if he must be playing a part, with a view to creating an impres-

sion favorable and helpful to his own case. It was of course possible for him to have adopted some definite line of action, supposing that he was bright enough to have reasoned it out, which would have presented indications of some form of insanity. While he never at any time actually feigned specific symptoms, it looked a little at first as if he had seized on certain salient points, which he lost no opportunity of bringing into the foreground. And the probability is that he saw that the inquiry was directed to the finding out of a particular kind of data, and he thought he would give us all we wanted, and so his story grew and grew, being a mixture of truth and fiction. Yet as time went on it was evident that he followed no definite plan in what he said, and often (from any point of view he could have had of his own) he made admissions more injurious than helpful to his case.

Without reproducing here in detail much of what was elicited in our examinations, attention may be properly called to some of the principal points which, if later proved to be true, would have a positive value as evidence of mental weakness; while on the other hand, if shown to be false, would militate against such a theory.

First may be mentioned his account of an uncontrolled tendency to steal money and articles of little or no value from his early youth up to the time of his final arrest. He stole a watch and chain when he was about ten years of age; money from his father and from his employers, as well as various articles from them. He stole a tent, which he used in some woods near where he lived and for the larceny of which he was sent to the reformatory; articles at the reformatory; small sums of money from the hotels where he was employed for nearly three years shortly before the crime, as well as numerous small and cheap articles, such as hair brushes, tooth brushes and so on. The money he took from guests' bags, the hotel cash-drawer, the cigar stand, and the safe. There were several features of this pilfering from hotels which deserve notice, the first being the smallness of the amounts taken; the second, the cunningness of execution, so that it was not found out; and the third, that the money was not spent on drink and women, but saved and put into the bank with other money earned; and the fourth, that he kept a record of all the

money he stole, meaning to pay it back when he was twenty-five, a statement to be immediately explained.

Second may be mentioned his statements about his having a contract with the devil, beginning when he stole the watch, about the age of ten, and to expire when he was twenty-five. He never attempted to thrust this devil story into his conversation, but was ready to detail it if encouraged to do so. He had both seen and talked with the devil, he said; though there was evidence that he resorted to fiction in describing him, it appeared probable that he believed a portion of what he said. He frankly confessed that he had been brought up to believe in the conventional devil, but this one was different. He had a dark complexion; eyes like drops of water; dark hair streaked with grey, and a deep bass voice. When asked how tall the devil was, he thought it an immense joke to say, "as tall as you"; he could not help dropping into cheap or vulgar buffoonery when occasion offered. At our different interviews he mentioned categorically, though with constantly added details, what the devil said and how he behaved. It was most difficult, in fact impossible, for the writer to get at Kelley's real idea about the devil. The thing that was the most genuine and had some hold of him was his compact with the devil, which, as already mentioned, was binding to a certain time. He honestly believed in a personal devil, and thought he was in his power. As to how he looked and behaved, he made so many statements that it was easier to believe he was lying, than that he had actual delusions and hallucinations. There was without doubt something in the devil story, but just how much importance to give to it could not be determined during the examinations.

Third, he had had three attacks of somnambulism.

Fourth, he had had syphilis and at various times immoral relations with women.

Fifth, he never drank to excess.

Sixth, though he was very amiable, hail-fellow-well-met, and was generally liked, he had no intimate friends or comrades except a respectable girl with whom he "kept company." As a result of this peculiarity he was able to conceal his constant and curious thefts and his other bad practices for years; even his sweetheart did not receive his full confidence.

Seventh, the way he committed the crime, and his relation to it, was most strange and unusual, and became more unnatural each time that he talked of it. He seemed to actually delight in telling about the murder, and was never happier than when he was narrating its most terrible details. He no doubt had long thought of robbing the bank, and had taken a room opposite for the purpose of watching what went on. Not long before the murder he had stolen a pistol which had been found in his room, and he was in trouble about it, but such details did not upset him. A few days before the murder he went to Boston and bought a false moustache, black-jack, chloroform and straps. While he told no one of what he intended to do, it cannot be said that he took extreme care to conceal his movements. The things that had almost always diverted suspicion from him were his reputation of being good-natured and inoffensive, and his having had no intimate friends or pals to betray his wrongdoing, and had he had the shrewdness to realize his advantage in these respects and exercised ordinary self-control and judgment, the crime might never have been discovered. That he was lacking in these qualities the evidence later to be referred to makes especially clear.

With the greatest gusto he related how he watched the bank at the noon hour on the first day he made the attempt to rob it, to see the female assistant cashier go out, leaving the cashier alone. How he then went to the bank in a partial disguise, intending to pass himself off as a detective, his plan being to tell the cashier that a gang of "crooks" intended to "crack the safe," having already connected wires with it, which he would locate if the cashier would take him to the safe. By this means he would gain access to the safe, and have a chance to assault the old man at the same time. He failed in the accomplishment of this plan, because the assistant cashier had not gone out to dinner, and he went away so hurriedly that he left a bundle on a window seat in the bank entrance containing some of his outfit for the robbery. Later, when he was in an oyster saloon, he remembered that he had left his bundle and went back for it.

The murder was committed on Friday. During our examinations he insisted on it that his first visit to the bank was made on the previous Wednesday, and that all the time between Wed-

nesday night and Friday morning up to half-past ten o'clock was a blank to him. It was, however, proved by evidence presented at the trial that it was Thursday, and that on that day he appeared in every way as usual. He undoubtedly was lying about his condition on Thursday, having for some reason got the idea that it would be advantageous to his case to prove that he had periods of unconsciousness, of which this would be a most desirable illustration.

On the fatal Friday he wrote in his room or office an order for some stamps belonging to the postmaster, which were in the bank safe, watched until he saw the old cashier was alone, then with his black-jack, razor, chloroform, straps, disguise, and a pillow-case stolen from his boarding-house, repaired to the bank shortly after twelve o'clock. Some of his things were done up in a paper parcel. It is a question in the writer's mind whether he contemplated murder. Like a boy, he had armed himself to the teeth, but that alone would not be proof in such a fellow as Kelley that murder was intended. What he wanted was the money in the safe. Whether he went as far as to plan the details of a murder and just what he would do afterwards is, in spite of considerable evidence to the contrary, open to doubt. Even what he said himself is misleading. He asserted that he did intend to commit murder. Once he said he thought of it in his office; another time he said it was on his way across the street to the bank. But these answers were made in response to leading questions and cannot be too implicitly relied on.

Arriving at the bank, he handed the old cashier the order for the stamps. They were promptly given him through the window, and not, as he had probably expected, through the door in the wire partition between the front and back part of the room. His next move was to ask the cashier to take his package and keep it until the next morning. That brought the old man to the door in the partition, and then it was that he felled him to the floor. Just what went through Kelley's mind as he rained the blows with his black-jack on the defenseless cashier's head can never be known. He says himself: "He opened the door and I struck him. When I struck him the first blow he fell right to the floor. Then I kept on striking him as hard as I could. Well, when I struck him I felt blood on my face; it was

like sweat. Then I took my razor out of the case and cut his throat." This description of what would ordinarily be the very climax of horror, and from the narration of which one would suppose almost any criminal, however hardened, would shrink, Kelley delivered with care and deliberation, and with an air of pleased satisfaction, as if he felt sure of the sympathy of his auditors.

The cashier being disposed of, he took a little money out of his (the cashier's) pocket-book and the bank keys out of his pocket, and locked the outside door of the bank. Next he proceeded to rifle the safe of the gold and silver, putting all but a few dollars into the stolen pillow-case, also the package of stamps. Then he threw away in the bank two or three of the things he had brought with him, donned his disguise and prepared to leave.

At this point he apparently became frightened, and his presence of mind partially deserted him. His own explanation was that he saw through the glass panel of the bank door the face of the devil, who was holding the handle of the door and grinning at him. This so upset him that he turned to a window to escape, but looking around again he saw that the devil had gone. Then he went to the door, but was too frightened to unlock it, so he smashed the heavy plate glass with his foot, got through the opening thus made, hurried down the stairs, and made his exit from the building.

Such is in brief the account of the crime as given by Kelley up to the time of leaving the bank. His subsequent movements, which are of some medico-legal importance, can best be considered in connection with the evidence.

Eighth. A point to which special attention should be called was his conception of the difference between right and wrong, and other moral distinctions. His lack of any feeling of remorse for his crime, or any realization that it was a thing of which he should be ashamed, has already been referred to. He was, perhaps, not proud of it, but he did believe it to be rather a creditable performance. He said himself in detailing his conversation with the devil: "I was glad I had killed Mr. Stickney. I felt good and was tickled to death." Then he went on to say: "I had no reason for thinking I had done a good thing. Think (now) I had done wrong. Sometimes not sorry

I did it. It will benefit some people. There is no one dies but somebody grows better or worse. I have always noticed in families one grows better or worse. . . . I have come to this conclusion from observation. When I die people will grow worse, because they are all good now. I would like to feel sorry for killing Mr. Stickney, but I can't; I can't make myself believe so." Later in the same conversation he said: "I think no murderer is ever forgiven. I have asked God to wipe this thing all out, but he won't. It does no good to pray. I shall not be forgiven until January 16, 1899, when I am twenty-five years old (when the devil compact expires). God will not help me any now. The devil has got hold of me. . . . I can't excite myself to feel any compunction. I don't feel for anything nor for anybody."

When talking with him on other occasions he said "he knew it was a dirty, cowardly deed," but he never felt or showed any feeling of sorrow. He seemed to realize this and to regret it, and said he'd rather feel bad than the way he did. "I want some one to pray for me to be sorry. I am too happy now. . . . I am going to plead not guilty because the lawyers want me to, but I am guilty. I had rather be hung than go to prison, because this (the latter) would be paying fifty cents on the dollar, and I had rather pay my whole debt." He said at the close of one long interview: "Doctors, lawyers and reporters are all alike, they are all professional liars." Another time he told us he knew what we were there for: to make him out insane, but he was not insane.

Ninth, mention should be made of Kelley's poetry. He was told by his counsel the last day we visited him that we would like to hear some of his poetry, so with the greatest good nature he went to his cell and brought out a blank book into which he had copied a number of his poems. He read them standing up, in a clear, self-confident schoolboyish tone of voice, pleased rather than otherwise with the effect they produced. The poetry-writing began three months before. One day he said he found that the words in a letter had a tendency to rhyme with each other, and since then he had had no difficulty in making poetry. How much value should be attached to poetry written as this was while he was confined in prison as a noted criminal, perhaps somewhat exhilarated and with a sense of his self-importance, it is difficult to determine. Especially so, it may be said, as he

was pressed to write poetry, if we may judge from his letters, and for this reason he may have applied himself more diligently to the task than would otherwise have been the case. In a letter under date of July 18th, 1897, for instance, he says: "I have written four poems, and my lawyers want me to write a lot of them." In estimating the significance of the poetry-writing, these circumstances must be taken into account.

The following samples will give one a fair idea of the kind of poetry Kelley seems to have written:

DREAMS OF BOYHOOD DAYS.

As he sat there alone,
Thinking of the years gone by,
Of the happy home and mother,
From his heart there came a sigh.
The sisters and the brothers,
The shaded lover' lane,
The old seat by the running brook,
He ne'er shall see again.

The roses in the garden,
The cerious nightly bloom,
All is still and fragrant
'Neath the silvery shining moon.
The twinkling little stars,
The beautiful northern lights,
These sights he ne'er shall see again
On balmy summer nights.

On the door stoop by his side
With the one he loved so dear,
He spoke in pleasant whispers
That none but she might hear.
The swaying elm trees,
The waving fields of grain,
The little girl he loved so much
He ne'er shall see again.

No more the golden sun will see,
No more the rising moon,
Nor the white sails on the ocean,
Nor the screeching big black loon.
The earth is still the same,
The waters ever run;
But the poet's life is ended,
His work on earth is done.

(Joseph E. Kelley.)

THE 20th CENTURY GIRLS.

When girls are little babies,
They cry, they scratch and bite;
And papa has the pleasure
Of rocking her at night.

She is a little darling,
A precious little child;
But when she cries and hollars
She makes poor papa wild.

When at the age of sweet sixteen,
She still has her childish ways,
It's strange that she remembers them
Most all her live long days.

She sits down in your lap,
She bites, she hugs, she kisses;
Me thinks at times our sweet sixteens
The nursing bottle misses.

(JOSEPH E. KELLEY.)

WILL.

Dover, N. H., Aug. 16, '97.

Hung by the neck until dead
Is very easy to say,
And this is to be my fate
In January, on the sixteenth day.
Yes, the sentence has been passed,
Dead is all future hope;
The people of Strafford County
Have got me on a rope.
I do not wish to make a will,
For I have few bequests to make;
In the shape of bloody weapons,
Which I give for remembrance sake.
The razor which cut the throat
Of the cashier of the bank
I give to James A. Edgerly,
A lawyer of high rank.
He is after all such things;
A kind of souvenir crank.
His office is at Somersworth,
Quite near the savings bank.

To my junior counsel, Mr. Ryan,
I give the small black-jack
With which I struck the kind cashier
A well-directed crack.
The straps and chloroform
You may equally divide;
They led me to the awful crime
By which the cashier died.
As my counsel and advisors,
I trust that you will see
That after I am dead,
Dissected I shall be.
Bancroft of Concord may have my body,
If to experiment he feels inclined.
He then can tell the people
All about my mind.
The last thing that I ask of you,
Let no friend see my face;
But remove me from the prison
To Doctor Bancroft's place.
And after he is through with me,
Cremated I wish to be.
If justice is only satisfied,
It's all the same to me.

(Joseph E. Kelley.)

THE CONVICT'S PRAYER.

A prisoner on an autumn day
On bended knees to God did pray:

O God! in Thy mercy and holy love,
Send down Thy blessing from above.

Give me sorrow for every sin,
That Thy love and friendship I may win.

Like the fading, dying flower,
Thou cans't save me by Thy power.

Help the lawyers in my case
By Thy holy loving grace.

Although they lie, and against Thee sin,
They are working cheap, for I have no tin.

And while they sit about the hearth,
In time You can give them a nice warm berth.

Help the doctors, of Thee I beg,
For they are pulling the county's leg.

If they much more my caranium drum,
They will put the county on the bum.

But, good Lord, have mercy, and lay not up a feeling,
It's the best and safest way to do the sin of stealing.

Have mercy on the ladies who practice salts and pills,
And show them how to do like men, to send in nice big bills.

Forgive the sheriff, of Thee I pray,
And help him on election day.

And if a vote or two is bought,
Make his life—as jailor very short.

As high sheriff he will pass,
Though he has the manners of a big jackass.

His wife, God bless her, I don't think,
Has driven him crazy, to rum and drink.

God bless the attorney-general, and the county attorney, too,
And should they go to Heaven, don't place them in the zoo.

God bless the judges, so solemn and calm,
And keep them from spiritual and bodily harm.

God bless the jury, one and all,
The young, the old, the large and small.

Give them grace to consider the case,
And on facts and evidence their opinions base.

God bless us when we are laid at rest,
And take us to the land of blest—

The land that ever is the same,
We ask of Thee in Jesus' name.
Amen.

Kelley's letters written in the jail, of which the writer has examined about twenty, are similar in tenor to his conversation. They show only a fair amount of facility of expression, but are

written carefully and in a handsome hand. They were probably all seen before being mailed, which may account for their correctness and carefulness. They were nearly all written to members of his family, and chiefly to a sister. He refers in several of them to his relations with the devil and of the impossibility of his doing right while under his influence.

In a letter written May 14, 1897, he says: "I am a child of the devil, and you need have no fear for what I have done. I am not as bad as you think, and know God knows the trouble I am in. I expected to live until I was fifty, and half of my life was for the devil and half for God."

In a letter written on the 30th of April, 1897, he says: "I don't feel as though I have done anything, but of course I have, but it does not make me feel as bad as I ought to feel."

May 22, 1897, he writes that "Life on earth was hell to me, but here I am at ease and happy. . . . About five years ago my Guardian Angel told me to go to see Bishop Bradey and he would drive the devil off, and now I am going to write him and ask him to bless me and I shall feel safe."

In several letters he says he is very happy, and that "prison is heaven to what the outside world is," meaning probably that he feels that he will be prevented in prison from yielding to the devil's influence and doing wrong.

There is one letter written about three weeks before the murder which appears to be in every way a common, plain, direct letter. In several of the letters severe remarks are made about the experts' visits. One dated August 4, 1897, is written to Dr. Bancroft, and is as follows: "My lawyers lied to me; don't come any more, for I am all right. You are a man that likes to see justice done, and so am I. Will be in Concord in October and will tell you something good at that time." (He refers to going to the State prison when he speaks of being in Concord in October.)

In estimating the value of the letters as evidence, it must be remembered that they were written while he was under the watchful observation of his counsel and a number of experts, and he might (had he been feigning) have been cunning enough to make use of them to express his irrational ideas. It is more probable, however, that he expressed himself as he really felt, and hence they tend to corroborate the statements he made in conversation.

Such is a partial report of the investigation at the jail into Kelley's mental condition. At its close the writer was strongly impressed with the feeling that he was not playing a rôle for the

occasion; that he was *himself*, and only acting out what was natural to him. He had always lied and with some cunning trimmed his sails to the blast of the moment. It was natural for him to be shifty and tricky, and he was not above taking advantage of subterfuge. Still his desire was to be frank and straightforward, as no doubt his counsel told him it was best for him to be, and his lying was justified, in his opinion, when it would make the truth of his statements more apparent. On the whole he stood the ordeal wonderfully well. Probably no feigner could have gone through so many long days of severe and rigid cross-examination without at least partially breaking down. At the end, as at the beginning, he was the same pleasant, happy, superficially sharp, self-reliant boy. He had always had plenty of egotism, which no doubt the notoriety of the crime had materially augmented, still it was far from having the quality of obtrusiveness and aggressiveness characteristic of the so-called "paranoiac."

It was apparent that he was not the subject of any form of insanity, but it was equally apparent that he was quite unlike the ordinary young man of twenty-three. While he had a quick, wide-awake way of taking things in and some degree of so-called smartness, he had no maturity of judgment. His lack of moral sense was, however, the most striking indication he presented of an undeveloped mind and character. The conclusion was inevitable that he was a degenerate with congenital or acquired criminal instincts.

How far he could be held responsible for the crime was at the end of the examination a difficult matter to determine satisfactorily, and fortunately it was not necessary to give an opinion until all the evidence had been presented at the trial.

Kelley was the same happy, good-natured boy when he appeared in the court-room that he had been in the jail, and was evidently pleased to be the observed of all observers. He was neatly and tastefully dressed, and healthy and attractive looking. Each step in the proceedings he followed with interest, and was on the *qui vive* to give his counsel hints or advice, a thing he could easily do, as he sat in the bar close beside them.

He listened carefully to the simple and direct yet forceful and convincing opening address of the counsel for the State. It

was arranged that the jury should visit the scene of the murder, and in accordance with the law of New Hampshire Kelley went with them. He rode to the bank from Dover in an electric car with the lawyers, some of the experts, newspaper men and sheriffs, and he was the most cheerful and unconcerned member of the party. He acted as master of ceremonies at the bank, showing the exact spot where the old cashier met his death. His nonchalance and total lack of appreciation of his crime and its consequences, combined with his jocose yet pleasant and polite manner on this occasion, were something incredible in the man of sound and normal mind.

The evidence presented by the State proved easily and conclusively that he was guilty of the murder. Its medico-legal interest consisted in the account of his strange actions both before and afterward. These actions showed recklessness, carelessness and bungling, and a great lack of judgment. The brown paper he used to do up some of his things in, and in which he probably intended to wrap up the stolen money, he borrowed in a conspicuous way of a local tradesman, and then he left it in his haste at the bank door after he had committed the murder. There was little difficulty in tracing this paper directly to him. The order for the stamps, already spoken of, was in his own handwriting, and he left that in his haste on the bank counter. The stolen pillow-case, also already spoken of, he slung over his shoulder, walked out into the street with, and then took through streets where he was seen (though not recognized because of his disguise), to an orchard where he was seen. Here he left it covered with his coat, and after changing his hat he went to his boarding house, calmly eating a little dinner. He then hired a horse and buggy, ostensibly to go fishing, and returned to the orchard (being seen by several persons) to get the money, putting it into a dress-suit case, after which he again returned to his boarding house and paid his landlady out of the stolen money part of the sum he owed her. His next move was to drive some miles to the town of Milton, where he put his horse in a stable (the horse showing evidences of rapid driving) and bought a new coat and hat, leaving his old hat in the livery stable. He enquired if there was any one who sold glasses in the town; went to a hotel, where he met an old acquaintance;

took a train bound toward Canada; on the train kept a good deal to himself, yet spoke to several persons, some of whom he had previously known. He gave the stolen stamps to a brakeman to mail for him, paying him liberally for doing so. They were directed to " L. J. Sullivan, Montreal," the letters " L. J." being the initials of Sullivan the pugilist reversed. The stamps were carelessly done up and mailed in such a peculiar way that the postmaster decided they had been stolen and would not forward them.

It is impossible to minutely follow each step in Kelley's movements in the limits of this paper. It must be stated, however, that by a series of what appeared to be rather haphazard changes from one train to another, he finally turned up in a little Canadian village named St. Justin de Newton, telling a very plausible story (about coming to Canada on account of trouble he got into by selling liquor) to the keeper of an inn where he lodged. On the Monday, three days after the murder, he bought a woman's dress and bonnet of the innkeeper, paying an exorbitant price for them, which he wished to use for a disguise, he said, to go to Montreal to see his wife who was there, and he proposed to bring her back with him. The dress was that of an old woman and entirely out of keeping with his apparent age, but that did not seem to trouble him, and he took the train for Montreal, going straight to a house of ill-fame. All such houses had been warned of his possible arrival, and the police being notified, he was immediately arrested and before the next morning had confessed the crime. After taking the officers to the place where he had thrown away some of the money, he returned to Somersworth without a requisition, and was his usual pleasant, congenial self on the journey. Such are the facts relative to his conduct after the murder, presented and proved by the State.

He could not well have pursued a course which would furnish more clues, once suspicion turned toward him. Instead of covering his tracks, he left them visible up to the time he changed, as if by sudden impulse, from one train to another. He was temporarily safe perhaps on Sunday when in the small country inn, and his best chance lay in keeping himself hidden from sight, but the reckless, hare-brained boy in him impelled him to go to a city and have a spree. He could not have more adroitly

thrown himself into the hands of his pursuers than by visiting a house of ill-fame, his reputation being just shady enough to suggest his doing such a thing. Disguising himself as he did illustrated his cunning and recklessness, but it only aided him in walking directly into the lion's mouth.

Carefully analyzing all that he did after the murder, the conclusion is forced on one that he acted with little judgment and foresight, threw away such opportunities as he had for escape, and stupidly and without reason allowed himself to be caught.

The prosecution having put in their case, the defense next outlined in their opening what they would rely on to prove the claim of insanity. Said Mr. Ryan, who made the opening address:

You have heard the story of the crime and a partial account of this young man's life. You have noted the many peculiarities of this remarkable homicide.

To these facts and circumstances we desire to especially call your attention, and that of the physicians, as showing in a measure his mental condition. The boy was born in Amesbury, Mass., on the 15th day of January, 1874. He was the fourth of a family of eight children, all living.

The prisoner was born a healthy, well-developed child, and grew up to the age of four years a bright, happy, laughing child, until a fatal day in September, 1878, while at play with another child upon what is known as a carriage brow, he met with an accident. The place from which the boy fell was a distance of from 12 to 14 feet from the ground. He was picked up unconscious and so remained for two or three days.

A witness will say that he went to the place where the accident happened and picked up a board with a common tenpenny nail driven through it. He says the nail was rusty, and he noticed that there was blood upon at least a half-inch of it. The nail looked as if a small piece of it had been recently broken off.

During the period that the boy was confined in bed from the injury he suffered from what are commonly called fits or convulsions, and he continued to have fits up to about the age of 13 or 14.

When he was 15 or 16 years of age he used to say that the devil was here or there, or in his room or somewhere all the time. He did not care for money at all. He one time took two $5 gold pieces, and one he gave to a boy and the other he battered with two stones. He was 10 or 12 years old at that time. Another time he took a gold watch and chain from the house and gave it to a boy for a New York pictorial newspaper.

He was sent to the reformatory because he took so many things that did not belong to him. One day he was passing along the road with two other boys and he saw a man in a field at work. He had a revolver in his pocket and he took it out and fired twice at the man. He did not

know the man, and when he was asked why he did it he would make no reply. Once he shot himself in the arm.

He seemed to be always afraid, and kept a sword in his room to defend himself with, and always carried a revolver in his pocket. He wrote a letter to his father while he was at Grant's Hotel, stating he was going to build a hotel on a hill in Amesbury; that it was to cover two acres of land and be the finest hotel in the country, and that he was going to entertain all the nobility of England in it. When he was in the Concord prison he wrote a letter in regard to an elephant, in which he said: "You done a good job on the elephant. I was watching you. He tried to crush you up against the wall, but you knocked him down with the hammer and put the shoe on him in good shape."

We shall have a number of witnesses from Amesbury who will testify as to his having fits and his peculiarities when he played ball, and that they regarded him as a foolish boy.

It will appear that as he was released from the reformatory he went to Somersworth and there undertook to obtain employment. We shall show you conclusively that this prisoner never had the capacity to hold any position of any kind or description that could not have been held or filled by a boy of 10 years.

The above is in substance, as taken from the Boston *Herald*, a portion of the opening for the defense. It was closed by an appeal to the jury on the nature of the responsibilities which they assumed, as the issue to be determined was one involving life and death.

The life at stake being Kelley's own, it was both interesting and important to notice how he behaved during his counsel's address, when for the first time he was hearing how his case was to be defended. Sitting, as he did, side by side by the experts, there could not have been a better opportunity to watch him. Now, as always before, however, he was the same pleasant, cool, jocose Kelley. He was quick to catch any little point and preserved a critical, observant attitude, not indifferent to what was going on, but absorbed in it. Yet all the time it was impossible to discover that he had the slightest conception of the magnitude of the crime or his relation to it. A *Herald* reporter very accurately pictured him in the following paragraph:

"He listened with great attention to what Mr. Ryan said, and when references were made to his devil he looked toward the *Herald* reporter and laughed. He also smiled frequently at Mr. Nason, counsel for the prosecution, who sat beside him while the opening was being made. When the statement was finished

Kelley told Mr. Ryan he thought it was a pretty good speech, much better than that delivered by Mr. Nason, and he said he did not think he got such a hard roast in it after all.

"Kelley's composure was not a bit disturbed by the generally interesting events of the day. He was as cool when the detectives were telling about how he acted at the time he was arrested for murder as when Mr. Ryan gave information to the jury about the thefts of his boyhood days. Sometimes he bit his lips at the talk his attorney made about insanity, but there were no other signs of nervousness."

The opening of the counsel for the defense occupied the closing portion of the afternoon session of the third day of the trial, and it had considerable weight as corroborative evidence of Kelley's peculiar mental condition, because it furnished an explanation of doubtful points in his account of himself, and further made it more possible to understand his boy-man make-up and his stunted moral nature. Though of course the statements made in the opening had not been proved to be true by evidence duly passed upon by the court, yet enough data had already been unofficially obtained by the writer to warrant him in assuming their probable accuracy.

Of great corroborative value also was Kelley's conduct in and out of court, especially during his counsel's address. It was in every way consistent with his conduct in the jail.

Thus little by little enough cumulative proof had been collected to focus and define the writer's opinion of Kelley's condition, which had been only partially arrived at after the examinations in the jail.

Upon the evening of the same day the counsel for the State and their experts held a conference, and later the experts of both sides conferred together. While in some respects they differed in their opinions, they were all prepared to go as far as to say that Kelley's brain was imperfectly developed, and that, in the full sense of the word, he was not responsible.

Such being the unanimous opinion of the experts, the counsel for both sides decided that Kelley should the next morning, at the opening of the court, retract the plea of "not guilty" and substitute that of "guilty." This he did in a neat little speech addressed to the court, delivered with a cool, self-possessed

manner and in a clear voice. The gist of what he said was that he would plead guilty provided he could have an extension of sixty days. What he meant by asking for this amount of time was, that if he was sentenced to be hung, the law of New Hampshire delaying the execution of sentence for one year, the sixty days extra would carry him to the time when his compact with the devil would expire and he could die a free man!

Kelley's plea of guilty made a remarkable change in the method of legal procedure, as what up to that time had been a jury trial became a hearing before a judge! A jury was no longer necessary under the law of New Hampshire, guilt being admitted. The responsibility of determining the degree of guilt is placed on the judge, and this depends on whether deliberation and premeditation can or cannot be proved.

It was a striking and never-to-be-forgotten moment when the jury, the supposed bulwark of justice and personal freedom, was dismissed, and on the judge alone was left the weight of deciding between life and death. It was, however, a weight more apparent than real, for the question resolved itself into one of two degrees of guilt, and the first was already, inferentially at least, excluded by the agreement of counsel that the prisoner should plead guilty because of his peculiar mental condition.

A portion of this, the fourth day of the trial, was spent in the introduction of evidence relative to Kelley's infancy and youth, corroborating the statements made in the opening of the defense and adding to their force by fuller details. It appeared that he had been a normal child up to four years of age, when the accident occurred resulting in an injury to the brain. As already stated, the seat of this injury is distinctly visible as a depression in the left frontal bone. After the accident there were epileptic convulsions up to 13 or 14 years of age. There was accompanying moral perversion and strange conduct noticeable enough to lead to his being called "foolish Joe," "Kelley's fool," and so on.

He stole persistently, unblushingly and openly. His father said in his testimony: "Beat all boys I ever see; would steal money wherever he see it." He shot himself, as stated by the doctor who treated him, simply to create a sensation. He ran off and wandered away from home on numerous occasions.

Altogether he was a troublesome, erratic boy, and finally after his arrest for larceny his father got a doctor to examine his head to see what was the matter with him, and the doctor told him it would not hurt him to go to the reformatory. He was always good-natured and got along well with people. At the jail, after the murder, when the father saw him he appeared just as he always had. He claimed as a boy to have seen the devil in his room, and there was a place in the wall where the plastering was broken in his attempts to strike the devil.

The mother testified that he thought the devil was after him when he was about twelve years of age. Both mother and sister told him the stealing was wrong, and the sister told him to pray, which he did, but he could not help the stealing. The mother, sister and brother testified to his walking in his sleep. Another sister testified that he drew well, and she asked him to draw houses, but he would always make pictures of the devil in red clothes with a five-tined fork held up in the air.

The doctor who attended him when he shot himself in the arm at the age of sixteen said in his testimony: "From his look and manners he seemed to me unsound. I thought he was regarded below par. He seemed exalted then. He appears very much the same now as then."

Testimony was presented which showed that during the year before the murder, Kelley had undertaken schemes which were of a more ambitious and erratic character than at any previous time. He started a summer hotel on less than three hundred dollars, which was largely stolen money deposited in the savings bank. This enterprise failed. He talked about starting a newspaper and evidently had a serious intention of doing so. An erratic undertaking was an advertising scheme by means of a megaphone, through which he cried various merchants' wares from the top of a building.

These references to the evidence presented by the defense are sufficient as illustrations of its general tenor, and help us very materially to understand Kelley's mental status.

MEDICAL TESTIMONY.

The medical testimony was presented at the close of the direct evidence for the defense. It was arranged that all of the six

experts should be called in succession, the first three being those for the defense. Those who have had occasion to testify under the ordinary conditions with a jury gazing in twelve different directions with a fixed, puzzled and stony stare, and opposing counsel intent on developing two diametrically opposite points of view, will readily perceive that the present situation was a far different one. The jury was pleasantly conspicuous by its absence. The counsel were sitting harmoniously side by side, and the experts could address themselves to the judge freely and in extenso, the hypothetical question, that most misleading and inadequate of forensic makeshifts, being allowed for once to slumber in silence. The pleasure and satisfaction of being able to try at least to say directly and simply on the witness-stand to an intelligent court just what one thought, it is hard to describe in words.

Dr. Charles P. Bancroft, the first expert for the defense, said that in his opinion Kelley's mental condition was one of arrested development due to an injury received upon his head in childhood. He thought the evidence showed that the prisoner was born healthy and continued a normal child until the day he met with the accident. That at that time he received such an injury to the brain as resulted in an improper, or rather prevented the subsequent normal development of the brain cells, and that there had been a consequent and corresponding failure in normal mental growth. He was a child in intellect and moral characteristics. He had many of the impulses and instincts of the adult, but his judgment for the carrying out of these plans was that of a mere child. His moral was more deficient than his intellectual capacity. Moral perversion was one of the earliest symptoms noticed. Next to the epileptiform attacks it was the striking characteristic of his early life and the one feature that made his management problematical. Next to moral obtuseness the most remarkable characteristic was a defective judgment, an inability to compare things properly, to discern the fitness of things, all of which suggests a general all-round deficiency of the higher intellectual processes. Coupled with this intellectual incapacity was an abnormal egoism, and an impulsiveness such as is characteristic of earliest childhood. Kelley never seemed capable of profiting by experience. This inability to exercise healthy judgment, to profit by the second sober thought, to make nice moral distinctions, and this rash impulsiveness that led him to childishly undertake the most absurd schemes that captivated his fancy, all indicate a generally arrested development of mind such as we understand is included in the term imbecility. The case would seem to be one of acquired or traumatic imbecility. Although an imbecile, he was by no means dull or stupid.

His perceptive faculties were unusually bright. But this brightness is evanescent rather than continuous. Back of and underlying this superficial elasticity of mind is the deficiency of judgment already referred to, the inability to maintain continuous exercise of the attention so essential to success anywhere, and a moral obtuseness which at one moment leads him to maintain a virtuous ideal and at the next to indulge in some moral excess.

Dr. Thomas Waterman, the second expert to be called, testified that he thought Kelley's responsibility very largely diminished, but whether absolutely or not he was not quite certain, but thought he would know in time. He regarded him as a case of arrested or defective brain development, and thought the expression that Dr. Bancroft had used, "high-grade imbecile," was expressive of his condition. He was exhilarated to a certain extent, and perhaps had an uncontrollable impulse to rob the bank and kill the cashier, or the killing of the cashier may have been incidental. "Question. He was not of sound mind at that time? Answer. He was not of sound mind; his responsibility was very largely diminished, and perhaps entirely so. I can't feel absolutely certain about his entire responsibility. Q. Could he form a deliberate and premeditated purpose as you would form? A. No, certainly not in that way. He doesn't have the judgment." On cross-examination witness said he thought the crime was probably the product of a diseased mind. Being asked to explain what he meant by probably, he replied that he said "probably" because in such a case he would want to observe it for months.

Dr. Wm. A. Gorton, the third expert for the defense, testified that he regarded Kelley of limited mental development, due probably to the injury of the brain received when he was a child. His condition on the day of the murder was the same that it had been for several years, and he is at present in a state of mental unsoundness. His trouble is not curable. It is a so-called degenerative trouble which is almost certain to go from bad to worse, showing more and more apparent evidence of mental degeneration. He did not have the capacity to carry a deliberate and premeditated purpose into effect as a sane person would have done. He did not have the capacity to resist an impulse in any sane sense. On cross-examination Dr. Gorton said that the first thing you would look for in a feigner would be any manifestation of insanity of an ordinary type. One of the things a feigner always does is to feign some well recognized form of insanity: to be stupid, or maniacal, or to go about and refuse to say anything. In Kelley all that was entirely absent. "I talked to him as I would to any one else about the crime. He gave a full account of it without any hesitation whatever, concealing nothing, as far as I could find out, which bore on his responsibility for it. My own experience with feigners has been that when they feigned a delusion it was for the purpose of excusing them from a crime which they had committed, and they have sought to throw the responsibility upon the delusion instead of on themselves. In this case the picture was exactly

reversed. The prisoner claimed that the devil, under whose guidance he had been, had absolutely nothing to do with this crime; that he alone was responsible." Dr. Gorton further testified that the prisoner did not have complete aberration of the mind, but arrest of mental development, an all-round arrest of development, and while he has left in him various impulses to do wrong and a certain amount of capacity to plan wrongful acts and conceal them, he has not the judgment and moral perception which would enable a person of sound mind to restrain them if the impulse to do them was once conceived.

The first expert for the prosecution was Dr. Edward Cowles. He was called immediately after Dr. Gorton. He testified that Kelley was the subject of limited responsibility. This was explained or described by the fact of his having an imperfect mental development; an imperfect development of a few parts of his mind. That he had epilepsy from five to fourteen is sufficient to account for a certain degree of the mental degeneration that appears in the ordinary observation of the man as he is seen here. The injury to the head probably accounts for the epilepsy. Some parts of his mind did go on to develop from the age of four through his youth, and in some degree perhaps most parts, but not all. The parts of a man's mind in which the defect appears can be explained in this way: he must have some perception of things going on around him; he must have memory, he must then have the power to reason and form judgments about what he remembers, and then he should have control of these—complete, effective normal control of his mental operations; then he should have normal development of the moral sense of right and wrong. In this case the prisoner has quick perception, he is alert and bright; he sees what is going on around him, perhaps to a greater degree than the average man. He has a good memory, but he lacks the essential power of control. He does form judgments, and of course has notions of things, and he does reason. But when he comes to motives his moral sense is decidedly defective and limited. . . . He does have natural affections and some feeling of regard for others, but that is imperfect and does not control his conduct. When he comes to act he acts upon his desires and impulses very largely, though with some reasoning about it. . . . He is gentle and amiable, . . . and he does not have the vicious traits that give him the desires and impulses to do very wrong things. . . . Because he is a person of rather good traits of character primarily, his impulses have not led him to some of the conduct that would put him out of relation with people about him. . . . From his impulse to petty thieving as a child, and in other ways, he has developed a good deal of sharpness and brightness for carrying out his ideas, which carry him through by his appearance on the surface. His thefts and his schemes for getting money have become larger as he has grown older, but he has shown his defect in not having the capacity to plan well and in not controlling his ideas sufficiently to form good judgments. The premeditating to do this deed first as a theft and then with a final impulse to commit the crime is a natural outcome of the

rather complicated condition already described. And the crime itself being so foreign to his general character and the quality of his mind, it is indisputably an evidence of want of reason and capacity to plan and conceive such a thing. His responsibility is limited in that way, rather than limited by what would be technically called insanity. It is more a limitation of responsibility that characterizes the criminal than an insane person, but in attempting to draw the line the difficulty arises that there is in the background the condition of disease which we have to consider: his epilepsy which has affected his nervous organization has given him an imperfect development and the crime has resulted.

Dr. George F. Jelly testified that he considered Kelley childish and erratic, though possessed of a great deal of mental acuteness. His moral perceptions are blunted; his ability to control his desires and impulses is blunted. . . . The case is one of limited responsibility on account of impaired mental development, which prevents him from exercising the power of premeditation and of deliberation. To that degree he is irresponsible. "I have been much impressed," said Dr. Jelly, "in watching him here, to notice his lack of reserve. I sat by him during most of the trial and was struck very much by the lack of concern which he showed after having plead guilty to the charge of murder, sitting drawing pictures, making careless and cheerful comments; and also last night when he shed tears, not because of his situation, but because he thought we had slighted him in regard to his poetry. He seemed more impressed by that fact—that we thought lightly of his poetry—than that he was accused of murder, or the fact that he had confessed murder and was liable to hang. These things are in line with impaired mental development and with that diminished responsibility which I believe exists in this case."

The writer was the last of the six experts called. He went over somewhat the same ground as those who had preceded him, and said he thought there was a defect in Kelley's brain which had resulted in mental instability and weakened power of resistance. His responsibility was limited as a result of the brain impairment. He thought there would be progressive degeneration and eventually complete mental break-down. He did not think that he possessed the capacity to form a premeditated and deliberate purpose to the degree that a sane man would.

This closed all the testimony in the case. The court established the degree of murder as that of the second degree, this being in New Hampshire a thirty years' sentence to the State prison, and the trial was at an end.

In seeking to make a diagnosis of Kelley's condition the conclusion is forced upon one that he belongs to the great class of degenerates. The physical signs presented by themselves somewhat aptly correspond to what we should expect to find in a big,

healthy boy. There are few anomalies, or what could be correctly called stigmata, unless we class facial expression as showing itself in muscular co-ordination as physical. *There is a lack of development to some extent physically in proportion to age.* The body has not outgrown the early teens. It has not matured fast enough. There are, however, no marked asymmetries or departures from the average. The physical signs are negative rather than positive, yet taken in connection with the mental stigmata have as much value as if they were more striking and obvious. *An undeveloped type may have as great a significance as an over-developed or an anomalous type.* As Hirsch[1] has well said: "In consequence of the disturbances of development in degeneracy, the quintessence of the malady is to be sought in the disproportion in which the mental factors stand to one another." So it may be said of the physical factors, which must be taken into consideration in connection with the mental. While alone they may have only a doubtful value, combined with the mental they may serve to bring out or to accentuate details which together go to make up the picture of degeneracy.

The mental stigmata in Kelley's case were obvious and striking, yet the physical signs helped to make clearer the disproportion in which the mental factors stood to each other, and so filled in and completed the picture.

Hirsch quotes Morel as dividing degenerates into four classes, the first embracing persons in whom there are no particular anomalies, but who are characterized by a so-called nervous temperament. The second class includes those persons who, while their intellectual powers are unimpaired, display a decided disturbance of their feelings and impulses, and consequently great defects and perversity in morals. The third class contains imbeciles whose mental weakness is limited to the intellect, so that the instincts hold sway over the understanding; and the fourth class, idiots, in whom the whole mental development is extremely low. Hirsch very properly calls attention to the fact that any classification is largely arbitrary, as one class imperceptibly shades into another, still such an attempt is of assistance in defining our ideas in a case like Kelley's. He approximates to the second class, though we could not say his intellectual

[1] Genius and Degeneration, by Wm. Hirsch, p. 122.

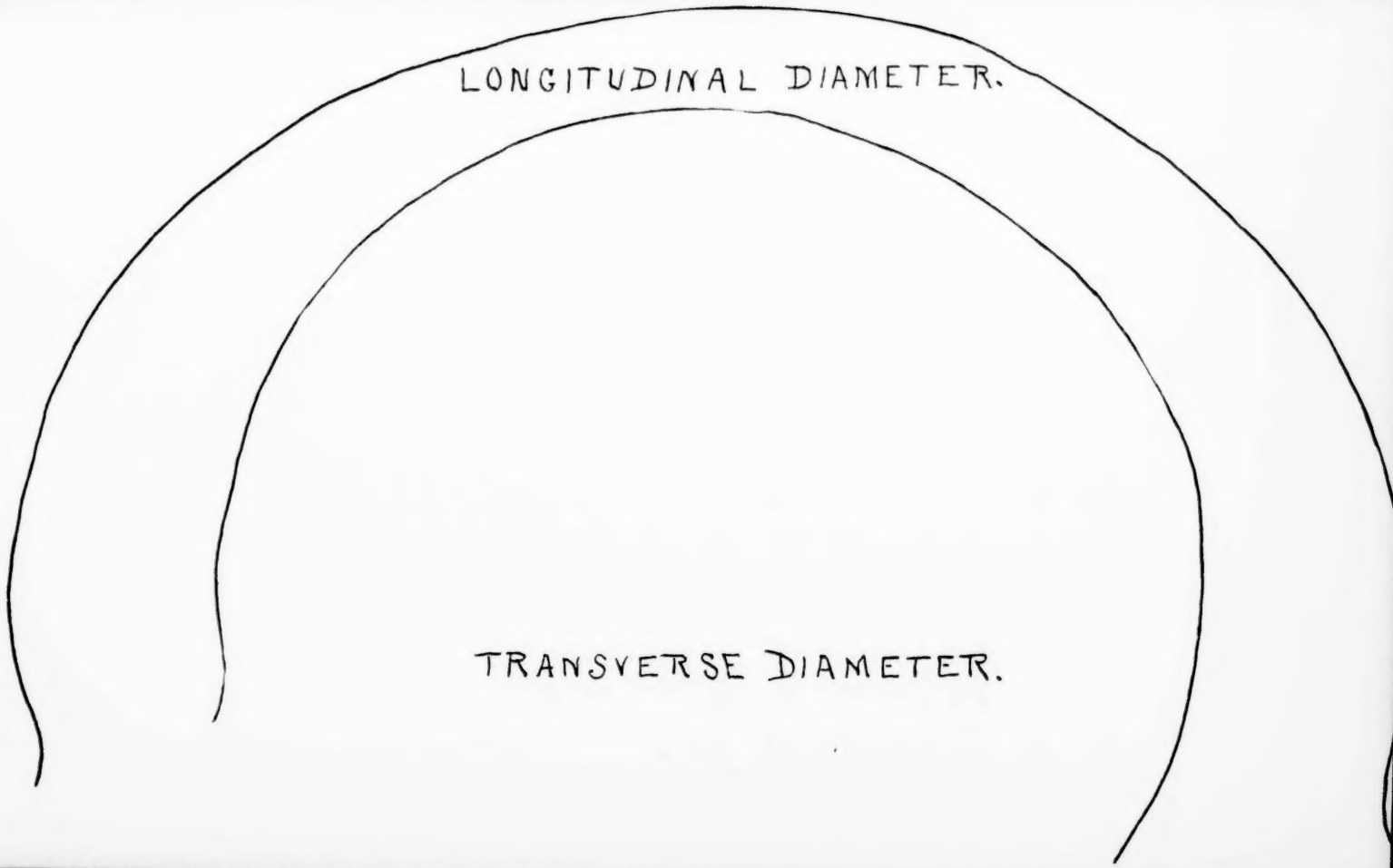
powers were wholly unimpaired. We would, however, say that the greatest disproportion existed between the intellectual and moral factors, that there was a decided disturbance of the feelings and impulses, and great defects and perversity of morals.

In conclusion attention may be directed to various points of medico-legal interest suggested by this case, a discussion of which would be quite beyond the scope of this paper. 1. The value of an examination of a criminal to determine his mental condition in the presence of a large number of persons is doubtful and uncertain, and may not in itself be sufficient to accomplish the desired object. 2. Each expert should be allowed to examine the prisoner alone. 3. In a medico-legal case the time of the trial should be extended until the experts have had every opportunity to form an opinion. 4. It would further the ends of justice and save expense to the State if the experts of both sides could have a conference before the trial, in order that they might come to some mutual understanding or formulate a joint opinion. 5. A conference being out of the question before the trial, a conference during the trial would be the next best thing. 6. It would add to the dignity of testifying in court if experts would at least endeavor to pursue such a course. 7. The best way for the expert to express his opinion is directly to the court. The clearness, directness and reliability of his testimony are largely enhanced by this means. 8. The hypothetical question is admirably calculated to befuddle juries; it stimulates hair-splitting on the part of counsel, and obliges doctors to make fools of themselves. The truth of this statement was abundantly proved in the present case, where, there being no hypothetical question, the expert was able to leave the witness-stand feeling that he still had some self-respect remaining and had not unwittingly stultified himself in giving his opinion. 9. A more searching inquiry into the subject of degeneracy and the mental status of degenerates is desirable. 10. Should experts define responsibility? Can they say in court a man is partly responsible? Would it be better in testifying not to attempt to draw a line between degrees of responsibility? Medically and informally the writer sees no objection to doing so. In the case at issue the prisoner was not apparently the subject of a specific form of insanity, yet he was deficient mentally and to a degree which interfered with his

complete responsibility. Did he have mental capacity enough to exercise in a sane sense the powers of deliberation and premeditation? was the question the court asked each expert. If not, he could not be responsible. But is a man who is not responsible a sane man? Fortunately these questions were not discussed, and the punishment was justly made to fit the degree of responsibility.

PLATE I.

To face page 414.


LONGITUDINAL DIAMETER.
TRANSVERSE DIAMETER.

HORIZONTAL CIRCUMFERENCE.

PLATE III.—PHOTOGRAPH OF KELLEY.

To follow Plate II, page 414.

ON MYXŒDEMA-LIKE CONDITIONS IN THE NEGRO.

By HENRY J. BERKLEY, M. D.,
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During the winter of 1897, in selecting the material among the idiots and half-idiots in the city asylum and adjacent almshouse for the class in psychiatry, I found a small number of atypical cases of sporadic cretinism among the white inmates, and among the blacks two or three cases of a peculiar thickening of local portions of the integument, strongly resembling myxœdematous swellings. As myxœdema in the negro race is at present an unknown malady, and universally denied, we concluded to make a further investigation of the entire population of about sixteen hundred souls in the two institutions, which included between three and four hundred negroes, a majority of these being mentally deficient. The search did not result in the discovery of more cases of cretinism among the whites, but in the addition to our stock of several cases of the local myxœdematous swelling in the blacks. To this material was subsequently added two further cases, one by the admission of a negro imbecile boy to the asylum; the other case was found in the city, a woman of middle age, who had had the tumefaction since childhood. These last two cases were under observation so short a time that it was impracticable to do more than make the diagnosis, but the examination given disclosed no marked variation from the more closely studied ones. Accordingly, we had, at command, a total of eight cases of a peculiar thickening, local in character, of the skin, in the black race, identical in all respects with that present in cases of sporadic cretinism in the Caucasian race, but less diffuse in character. Four examples were discovered among the idiots, one in a case of paretic dementia in the third stage, one in a case of acute mania, one in a demented patient whose antecedent history could not be obtained, and one in an individual who

exhibited no mental change beyond extreme slowness. With a single exception, an idiot girl, who might be placed more directly under the cretin type, the other cases showed the skin thickening very locally, and then only about the integument of the scalp and neck.

We have, therefore, a pathological condition differing considerably in its purely local characteristics from the ordinary diffuse myxœdematous swelling of the skin in sporadic cretinism, or from the myxœdema acquired from thyroid changes in later life, yet presenting perfectly the local characteristics of the malady; something I have found no description of in either text-book or journal article, and especially interesting from the standpoint of the denial of the occurrence of myxœdema in the negro race.

A general examination showed departures from the normal in the thyroid gland always to be present; in seven cases it was either not palpable or below the normal in size; in one it was enlarged. The hair showed alterations in two cases, being coarse, thin and rough. The bones were abnormally broad in only one case, the idiot approaching a cretinoid state, but even in this individual there seemed to be no defect in the growth lengthwise, the subject being quite up to the average in height. While the development of the skull showed many changes and departures from the normal in the growth of the bones, the region of the fontanelles had no abnormalities to be observed.

The secretions of the skin did not appear to be altered from the normal, and even over the myxœdematous areas there was little of the dryness and roughness, usually one of the principal characteristics of the disease. Where there was local tumefaction of the skin, the folds of the integument were obliterated.

The local swellings presented to the hand a firm, inelastic feel, as if jelly had been forced under the skin. There was not a trace of pitting on firm pressure, but a quick rebound when the pressure was removed.

Changes in the general bulk of the body were confined to two cases, and only with these exceptions were the features broadened or coarsened. Pendulousness of the abdomen was only marked in one example.

In the majority of the cases, slowness of thought and action could not be judged by the usual standards, but in the single case seen in the city it was notably present.

Trophic lesions and enlargement of the lymphatics were not found. An unusual fetor was only present in one case.

Individual Cases.

Case I.—Rebecca G., aet. 21, microcephalic type of idiocy, born in Baltimore. Height 165 cm., is well developed.

There is no family or previous history obtainable. Present examination March, 1897.

Is able to talk, and has considerable powers of attention. Has an occasional epileptic attack. Is neat and cleanly.

The skull is dolichocephalic and trigonocephalic, the circumference 48.5 cm., the cephalic index 76.2, the measurement over arch 31 cm., over antero-posterior diameter 31 cm.

The special senses are normal. The accommodative and light reflexes quick in responding to stimuli, while the consensual is slow. The deep reflexes are above par, the superficial normal.

There are no paralyses, defects in the vaso-motor condition, nor associated movement. The skin shows swellings of a firm jelly-like character over scalp, malar bones, and in less degrees about the legs; elsewhere it seems natural. The hair is coarse but not scant. The lips are slightly pendulous.

There is a slight degree of arterio-sclerosis. The thyroid gland is not palpable. Circumference of neck 31.1 cm. There is no exophthalmos. Heart sounds normal. The palate is flat, and there is a well marked torus palatinus. The teeth are regular and not decayed.

The long bones, especially those of the legs and forearms, are very broad. The muscular development is good.

The urinary analysis showed a deficiency in the amount of urea, chlorides and phosphates, but no albumen or sugar.

September, 1897. The swelling of the scalp is not so marked as in the spring, but that of the face has rather increased.

Case II.—Carrie A., congenital idiot, aet. 20, birthplace Virginia. Height 166 cm. No family history obtainable.

Vocabulary very limited. Attention fugacious. Is untidy in her habits.

Skull dolichocephalic, scaphocephalic. Frontal regions ill-developed. Circumference of skull 52 cm. Cephalic index 68.4. Measurement over arch 32 cm., over antero-posterior diameter

36 cm. The reflexes of all kinds are normal. In the right eye there is a staphyloma. There are no paralyses. Condition of arteries normal; the vaso-motor state fair. The bodily development is good, the bones are not broadened. The thyroid gland is very small. Circumference of neck 33 cm. The palate is low arched, and the teeth are defective. There is no exophthalmos.

The deposits of myxœdematous character are located in the scalp and forehead, and are very small.

Urinary analysis showed the phosphates decreased, urea and chlorides normal. No albumen.

Case III.—Eliza D., aet. 36, admitted to asylum in 1895, with general paralysis. Birthplace Maryland. Height 160 cm.

The general family history is good. All her brothers are mentally healthy. Has had one child, and no miscarriages. Acquired syphilis five years previous to admission. One aunt has been insane. There were well marked delusions of grandeur before patient became demented. There are now only occasional attacks of excitement. The skull is dolichocephalic, regular. The cephalic index is 76, the circumference 53 cm. The measurement over arch 36 cm., over antero-posterior diameter 36 cm. Eyesight is normal. Accommodation and consensual reflex are defective. Gustatory sensations defective. The deep and superficial reflexes are exaggerated. The gait is shambling. The vaso-motor state is poor. There is slight arterio-sclerosis. The skin, except over scalp, is normal; there it is much thickened, and boggy to the touch. The muscular development is fair; the long bones are normal for the height. The palate is flat, and the teeth of the upper jaw have entirely disappeared.

The thyroid is small, hardly palpable. The circumference of the neck is 31.5 cm. There is no exophthalmos.

Urinalysis showed decrease of the phosphates and chlorides, otherwise normal.

Case IV.—Kate S., dementia following chronic excitement. Forty-six years of age. Birthplace Maryland. Height 151 cm. History entirely unknown. There is considerable mental enfeeblement, and the attention is fugacious. Is untidy.

The skull is dolichocephalic, scaphocephalic. The cephalic index 72.8, the circumference 49 cm. Measurement over arch 32 cm. Over antero-posterior diameter 32. The special senses

and eye reflexes are normal, together with the deep and superficial reflexes. There is slight arterio-sclerosis. The physical development is fair. The palate is high arched; the teeth are normal.

The thyroid gland is small, the circumference of the neck 30.5 cm. The myxœdematous deposits are confined to the scalp.

Urinalysis showed the phosphates to be very much decreased, urea and chlorides normal. There is a trace of skatol.

Case V.—Mary P., aet. 40. No family history, and is very refractory.

Patient is greatly demented and untidy. The mental reduction followed chronic mania.

The skull is dolichocephalic, scaphocephalic. Cephalic index 76, circumference 51 cm. The special senses, eye reflexes and deep reflexes, as well as could be ascertained, were normal. The skin is natural, except over scalp, where there are hard, jelly-like deposits. The thyroid gland is very small. Circumference of neck 33 cm. The palate is low arched. The long bones are natural in proportion to the height of the individual. The teeth are good.

The urine showed deficiency of phosphates and urea. Trace of skatol.

Case VI.—Emma W., admitted for simple mania. Age 38. Height 169 cm.

Father died of dropsy, the mother of lung trouble. Was one of a family of fourteen children. Has had several living children, but no miscarriages. Is a beer drinker. After recovery from the maniacal attack there was no marked mental reduction. The menopause is about to commence. There have been no previous attacks of insanity.

The shape of the skull is dolichocephalic, regular. The cephalic index is 75.7. The cranial circumference is 56 cm. Measurements over arch and antero-posterior curves are 30 and 33.5 cm. respectively. There is nothing to note about the special senses, reflexes or physical development, or the osseous system.

There is a rich layer of fat over the whole body, and about the face, scalp and neck are diffuse boggy thickenings with the usual jelly-like feel. The arteries are normal. The thyroid gland is considerably hypertrophied. The circumference of the neck is

36 cm. The hair is very coarse. The palate is natural. The urinalysis showed no departure from the normal.

Case VII.—James S., born in Maryland, seventeen years of age. Is the youngest of a family of eight. The father is an alcoholic. None of the other children are mentally deficient. Is half-idiotic. Admitted to asylum April 26, suffering from an attack of acute mania. Has myxœdematous deposits about the scalp. Thyroid not palpable. Was removed by friends next morning before a complete examination could be made.

Case VIII.—Martha S., aet. 38, cook. Born in Virginia. Has over the whole body an abundant layer of fat. About the face and scalp are extensive jelly-like deposits, and here the skin is much thickened. Hair is inclined to be thin. Is very slow in action and thought; is not intelligent. Thyroid palpable, but small. Gives a history of having had the deposits since childhood.

During March, April and May the first five cases were kept under close observation (the sixth having recovered from the attack of mania, was discharged), and frequent urinary and blood examinations were made. The myxœdematous swellings in all of the cases neither decreased nor increased. A consensus of the urinary examinations during this time of Case I. showed:

Average specific gravity 1011. Urine always pale. Acid in reaction, no albumen or sugar. Urea 15 g. to liter. Phosphates normal.

Case II. showed:

Average sp. gr. 1007. Urine pale, acid in reaction. No albumen or sugar. No casts. Urea 12 g. to liter. Phosphates below normal.

Case III. showed:

Average sp. gr. 1012. Reaction acid, pale in color. No albumen or sugar. No casts. Urea 10 g. to liter. Phosphates below normal.

Case IV. showed:

Average sp. gr. 1011, straw color; no albumen, sugar or casts. Urea 15 g. to liter. Phosphates below normal.

Case V. showed:

Average sp. gr. 1013. Color yellow. Acid in reaction, no sugar, albumen or casts. Urea 10 g. per liter. Phosphates varying, sometimes below, sometimes normal.

A blood examination on April 15 gave the following results:

Case I	Hemoglobin (Gower's Hemoglobinometer)	92%	Red corpuscles	3,652,000
Case II	"	90%	"	3,337,150
Case III	"	97%	"	4,110,000
Case IV	"	98%	"	4,132,500

Case V. became totally unmanageable and had to be abandoned.

On May 22, the diet remaining the ordinary house diet, Case I. showed 4,879,680 erythrocytes, and the differential count, polynuclears 68.39 per cent.; lymphocytes, the small ones largely predominating, 23.26 per cent.; eosinophiles 6.28 per cent., transitionals 1.28 per cent. A very few red cells were below the normal in size. No nucleated red corpuscles were found.

Case II. gave erythrocytes 4,800,000 per cm., and the differential count, polynuclears 50.09 per cent.; lymphocytes, the small ones predominating in the proportion of 6 to 1 of the large, 39.16 per cent.; transitionals 2.15 per cent., eosinophiles 8.25 per cent., and myelocytes 60.35 per cent. There were no departures in the form of the red cells.

Case III. gave erythrocytes 4,854,000 per cm., and the differential count showed polynuclears 73.01 per cent.; lymphocytes, the small ones predominating in the proportion of 4 to 1, 19.79 per cent.; eosinophiles 5.54 per cent., transitionals 1.35 per cent.; the red cells showed no departures from the normal.

Case IV. gave erythrocytes 4,998,000, and the white differential count, polynuclears 44.24 per cent., lymphocytes 52.88 per cent., the small elements predominating in the proportion of 8 to 1; transitionals 1.02 per cent., and eosinophiles 1.86 per cent. The red corpuscles were perfectly normal. The urinary examinations did not differ essentially from those previously made.

In order to determine, if possible, whether the deposits about the scalp and neck of our cases were truly of a myxœdematous nature, it was determined to place the four manageable cases on some preparation of the thyroid gland. The preparation of Fairchild Bros. was chosen, as being freer from products of decomposition than any of the others, and on June 2 they were all placed on a single daily tablet of the desiccated gland. Previously notes on their general condition, temperature, pulse, respiration were made, and thereafter, throughout the course of the treat-

ment continued twice daily. The treatment lasted from June 2 to July 10, when it was discontinued. At the end of the fifth day two tablets were given, on the tenth day three were administered, and after the nineteenth day, with the exception of Case III., all received four tablets per diem.

Summarized, the results read as follows:

Case I. On June 2 the general condition of the patient is excellent. Tem. 98.5°, P. 80, R. 22. The next morning T. was 98°, P. 90, R. 24. At the end of the second day the T. had risen to 99°, and thereafter fluctuated between 98.5° and 99.2°, until four tablets were administered, when there was a descent for four days to 97.8°, and afterwards a normal temperature to the end of the treatment. During the administration of the three daily tablets the pulse varied between 68 and 82; when four tablets were given it rose to 96 beats, and then slowly declined with a maximum variation between morning and evening of 10 beats. The R. ran unevenly throughout the treatment, varying from 20 to 28, the maximum being reached on the administration of the fourth tablet.

After the thyroid had been administered five days a change was noticed in the mental disposition of the patient. She became brighter, more than usually cheerful, and moved about more than was customary. About the eleventh day the face was noticed to be a little puffy, and so continued until the end of the thyroid administration. The facial swelling never, though, acquired the consistency of the deposits in the scalp. On the eighteenth day the patient exhibited considerable mental and motor excitement, though not sufficient to cause the withdrawal of the drug.

June 22 a blood examination gave the following results:

		Differential Count.	
Red corpuscles	4,976,000	Polymorphonuclears	68.15%
White "	8,140	Large mononuclears	6.60%
Hemoglobin	95%	Small "	18.32%
		Transitionals	3.96%
		Eosinophiles	2.79%

The urine at this date gave the accompanying reactions: Color, straw; sp. gr., 1013, acid; urea, 9 g. to liter. Albumen and sugar none. Phosphates earthy and alkaline normal. Chlorides normal. On July 5 the sp. gr. had risen (diet remaining the

same) to 1018, urea to 12 g. per liter, the alkaline phosphates had diminished, while the other constituents remained unchanged. On July 10 the urea had increased to 20 g. per liter. The cutaneous transpiration is increased, owing, probably, to the warmer weather. The myxœdematous condition about the scalp had by this date perceptibly decreased, so much so, indeed, that great folds of the scalp-skin appeared when the skin was slightly compressed between the fingers, a condition that could not be obtained before the thyroid administration. (Fig. 1.)

Case II. When thyroid administration was first begun the physical condition of this patient was excellent. T. 98°, P. 80, R. 18. Like Case I., the temperature and respiration at first sank, the one to 97°, the other to 70 beats, while the R. rose very slightly. Thereafter the T. rose slightly, averaging 98.4°, and only after the dose was increased to four tablets daily did it reach 99°. The pulse averaged 90 beats until July 5, when it sank to 70. The R. showed some peculiar characteristics, sinking on July 1 to 11 in the morning and rising to 26 in the afternoon; the average change being 17 morning, 22 in the evening.

By the eighth day of the administration the mental characteristics of the patient altered slightly; she became more lively, but had no well marked excitement. The myxœdematous deposits on July 10 are slightly altered in volume. The secretion of the skin increased.

The blood examination, June 22, gave:

		Differential Count.	
Red corpuscles	4,592,000	Polymorphonuclears	73.10%
White "	6,500	Small mononuclears	17.33%
Hemoglobin	95%	Large "	4.65%
		Transitionals	2.46%
		Eosinophiles	2.46%

The urinalysis, June 21, gave: Color, pale straw; sp. gr., 1015; acid; urea, 11 g. to liter; chlorides, sulphates and phosphates normal.

On July 3: Color, amber; sp. gr., 1024, acid; urea, 22 g. per liter; chlorides, phosphates and sulphates normal. Sugar and albumen none. On July 10 the quantity of urea was 21 g. per liter.

The condition of the patient after the treatment was completed

rapidly returned to the usual state; indeed the treatment had little apparent effect beyond removing some of the myxœdematous deposit.

Case III. June 2; patient in fair physical condition; T. 97.8°, R. 24, P. 80. For three days after the commencement of the thyroid administration the T. continued to be a little over 99°, and then for four days ran below 98°. After the administration of the second and third tablets daily it passed the 100° line, and continued between 99° and 100° until July 6, when it dropped to 98°. The pulse gradually ascended, reaching its acme on June 12 (100), and then remained steadily between 90 and 100 beats, until July 5, when it dropped to 80 beats. The R. varied between 24 and 30 during the whole period of treatment.

The patient is much reduced mentally, being in the third stage of general paresis, but brightened up very much during the thyroid administration, became talkative, and for the time being was very much improved, and indeed retained some of the gain for several weeks. There was no unusual motor excitement. The boggy myxœdematous scalp greatly lessened in tenseness, and on slight pressure deep folds may be made in the skin of the scalp, a condition that before the administration of the thyroid was impossible to nearly the same degree. (Fig. 11.)

On July 25 the blood examination gave:

		Differential Count.	
Red corpuscles	4,212,000	Polynuclears	82.42%
White "	10,000	Small mononuclears	10.48%
Hemoglobin	90%	Large "	3.60%
		Transitionals	2.18%
		Eosinophiles	1.31%

A urinalysis, June 21, gave: Color, straw; sp. gr., 1016; react. neutral; urea, 9 g. to liter; chlorides and sulphates normal; earthy phosphates diminished; alkaline phosphates increased above normal; sugar and albumen none. Calcium oxalate crystals were found during the microscopic examination.

On July 3 the result was: Color, amber; sp. gr., 1009, faintly acid; urea, 8 g. to liter; chlorides and sulphates normal; earthy phosphates diminished; alkaline normal. A trace of indican. The amount of urea on July 10 had increased to 21 g. per liter.

Case IV. Physical condition of this patient at beginning of

FIG. I.—Showing the condition of the scalp after the administration of the thyroid extract.

FIG. II.—Showing the condition of the scalp after the administration of the thyroid extract.

the treatment fair. T. 98.2°, P. 80, R. 20. The T. on the second day increased to 99°, but immediately fell to 97.5° and so remained for some days, but on June 9, after the administration of the second thyroid tablet, rose again to 99.2°, and so remained until after the administration of the third tablet (June 19), when it fell to 97.4°, and remained thereafter between 98° and 99°. The pulse rate followed closely the temperature, reaching its maximum, 100 beats, on the increase to the third and fourth tablet, and decreasing again as soon as the system became accustomed to the drug. The R. varied between 16 and 20, the maximum more often being in the morning than in the evening.

On June 26 the blood count gave:

		Differential Count.	
Red corpuscles	5,492,800	Polymorphonuclears	52.49%
White "	6,500	Small mononuclears	38.06%
Hemoglobin	95%	Large "	6.43%
		Transitionals	2.36%
		Eosinophiles	.65%

The urinalysis, June 21, showed: Color, light reddish brown; sp. gr., 1013, faintly acid; urea, 6 g. to liter; chlorides and earthy phosphates normal; alkaline phosphates and sulphates somewhat diminished. Microscopically there were numerous red corpuscles found; a few leucocytes, and vaginal epithelium.

On July 3: Color, pale straw; sp. gr., 1015, acid; urea, 9 g. per liter; chlorides, earthy phosphates and sulphates normal; alkaline phosphates diminished. No red corpuscles were found in this specimen, showing the hemoglobinuria to have been transient. On July 10, urea 10 g. to the liter.

Before the treatment was inaugurated patient was very much demented, quiet, indolent, seldom speaking to any one. During the administration she became much brighter, talked more intelligently, and has remained to the end of September brighter than formerly. The myxœdematous deposits decreased considerably during the treatment, only to return to their former state after its discontinuance.

The results obtained by the administration of the thyroid extract proved fairly conclusively that the jelly-like thickenings of the skin of the superior extremity, in the four cases, was of the same general nature as that in ordinary myxœdema; in other

words, that the effect of the administration of the dried thyroid gland was to remove it, in part, for the time being. It was also rather interesting to note that all these cases improved mentally during the period of administration, and did not return to their customary state until some time after it had been stopped. No ill effects were noticed from the action of the drug during the administration, as so often occurs in cases of ordinary insanity.

In view of the previous blood examinations in myxœdema by Kraepelin, Schmidt, Laache and others, we confidently expected to have more decided results from this part of the study than was actually obtained. Three of the subjects at the beginning of the investigation showed a moderate eosinophilia, which soon disappeared. One had a lymphocytosis of moderate degree. The hemoglobin percentage, however, excites more interest, standing throughout the examinations much higher than one could expect from the diet and unhygienic surroundings of the patients, the latter being entirely due to overcrowding.

Contrary to the observations of Kraepelin upon myxœdema, absolutely no abnormalities were ever discovered in the shape or diameter of the red cells of any of the patients.

The variation in the excretion of urea during the several months the patients were under observation is worthy of notice. In all of the several cases, during March, April and May, the amount was subnormal, averaging in the four most tractable subjects only 13 g. to the liter. During the early part of the thyroid administration it declined to only 8.75 g. per liter; then in the middle portion it rose to 12 g. to the liter, and at the end of the investigation to 18 g. per liter, but where previously all the cases had been below the normal, two now showed a slight excess, one the normal quantity, and one one-half of the normal. On September 23 the urea excretion had again fallen below the normal, now averaging only 8.38 g. to the liter. During the whole course of the investigation the diet of the patients was but slightly varied.

I am exceedingly indebted to Dr. Knapp, the resident at the asylum, and to Mr. Elting, for many of the blood and urinary examinations and for their careful observation of the cases.

THE BREADTH OF THE PSYCHIATRIC SPECIALTY.

By THEO. H. KELLOGG, M. D., New York.

The object of this paper is not solely and directly to formulate a reply to the critical and sceptic views sometimes expressed, as to alienistic knowledge, by those willing to add a little glory to their own branch of learning by detraction from the science of mental diseases, but rather to briefly turn the search-light of truth on such general facts as best display the full breadth of the psychiatric specialty. The idea that this specialty is narrow tends to obstruct its progress and to prevent such wide medical attainments as are absolutely essential to its successful practice. In its full height and depth psychiatry has only been fully mastered by a few great minds, and thus the unusual extensiveness and difficulties of this science, although readily overcome by systematic study, have served to raise doubts of its very existence in the minds of some legal and medical practitioners and of a few specialists ready to magnify their own narrower calling. What then are the actual facts in the case, and what is the full scope of the general education required in the practical, thorough and skillful psychiatrist?

The alienist must be well grounded in general medicine, not alone to treat intercurrent affections in his patients, but to deal successfully with all those internal diseases which bear such intimate relations to insanity. He must be an adept in their management and fully understand the etiological bearings to mental disorders of sexual, cardiac, gastro-intestinal and pulmonary affections. He must be familiar also as regards insanity with the diagnostic and prognostic significance of specific disease, and of all diathetic, toxic or auto-toxic states. If he have not great general ability as a clinician and therapeutist he cannot detect or remove the physical causes of mental disease. Even a host of affections known more specially to gynecologists, ophthalmologists and other specialists must not escape his attention. The

competent psychiatrist must possess also both general and special surgical knowledge, not alone to cope with the traumatic psychoses, but to comprehend the general causative relations of surgical affections to insanity and the modes of relief to be had by operative procedures. It is set forth in chapter XI of the writer's "Text-book on Mental Diseases" how important a rôle surgery has to play in psychiatry.

The practitioner of mental diseases must also lay a wide foundation of general anatomical and physiological knowledge. The technical attainment of an adequate acquaintance with the minute anatomy of the nervous system alone is a great labor, as those can well testify who have spent much time and money to learn it abroad, where it was formerly studied to best advantage. Then again the alienist must practically know all the main points of neurological science, in order to diagnose and treat the somatic symptoms of mental disease. In fact neurological and mental disorders are constantly and intimately blended, and are to be recognized and dealt with as parallel affections. The capable psychiatrist in hospital wards daily sees and prescribes for hosts of nervous as well as mental diseases. In fact the pathology of many forms of insanity cannot be determined without much facility in neurological diagnosis. The accomplished alienist must also know much of laboratory work, of microscopical pathology and of medical chemistry, bacteriology and toxicology. He must also possess no small amount of legal lore, and must be especially familiar with the judicial aspects of mental diseases, and statutory regulations as to insanity, and his duties, responsibilities and personal rights as an expert witness before judge and jury. He must determine doubtful cases of testamentary capacity and all forms of modified responsibility of the insane in civil cases brought into court, and in criminal offenses individual reputation and even the issues of life and death may rest upon his decision, which must be reached in accordance with the laws of evidence.

The most technical and special knowledge of the psychiatrist, however, is embraced under the terms psychological and alienistic, and includes all that is known of the science of mind in the one instance, and all that can be learned of the nature and symptoms of mental alienation in the second place.

Psychological studies to be successful must be broad and practical, and must lead to perfect acquaintance with the human mind, and the character and motives of men, women and children in all the walks of life. The science of human life must be familiarly known as well as the science of mind, and this implies an acquaintance with sociology and no mean amount of anthropological knowledge in the psychiatrist treating patients of all nationalities.

The clinical expertness of the physician who has devoted long years to the study of mental diseases is remarkable, and even so incredible as to be denied by some professional men not possessing it. As well might the special expertness of the neurologist, the ophthalmologist, or the gynecologist be called in question. It has even been openly propounded in court that any one with common sense could tell whether a person was sane or insane. So gross is this error that in a doubtful case of insanity to be decided, the opinion of an ignorant nurse having had years of observation in hospitals for the insane would be more reliable than that of the most intelligent professional man without any experience among the insane. In fact, every year of faithful study in psychiatry brings a constant increase in expertness in diagnosis, prognosis and treatment. The infinite variety in types and in the clinical progression of mental diseases renders the specialty practically inexhaustible; and it is not surprising that those who first approach its intricacies should be sceptic, as it is ever the wont of sciolists to be nihilistic in belief, and the greater the ignorance the more hopeless is the state of doubt.

Crude criticisms tending to belittle psychiatry should in no wise discourage the younger members of a specialty which rests on such broad foundations, laid by some of the greatest minds which have adorned medical science. Nor should there be loss of hope, but rather increase of determined ambition from the fact that the specialty demands such breadth of attainments that few countries can boast of more than a score of fully accomplished psychiatrists. A rapid augmentation of this number is soon to be expected from the rising generation of students of mental disorders, who are pressing forward in the oldest and broadest of all specialties.

It might be easy to enlarge this view of the real breadth of

the psychiatric specialty, and to point to the additional requirements of the practicing alienist, to his necessary understanding of general affairs, to his knowledge of hospital construction and management, to his ability to control and direct nurses and employees, and to the personal qualities which contribute to his success among his patients, but the object of these few lines is by no means to present the specialty in the light of laudation. The purpose of this paper will have been attained if by stating actual facts the doubts raised by adverse criticism and the natural difficulties of a trying specialty are in some measure allayed, or if this simple presentation of the real breadth of the specialty shall prove an incentive to renewed efforts on the part of any discouraged or fatigued co-laborer in the wide field of mental science.

PROCEEDINGS OF THE ASSOCIATION OF ASSISTANT PHYSICIANS OF HOSPITALS FOR THE INSANE.

The fifth meeting of the Association of Assistant Physicians of Hospitals for the Insane was held at the Wisconsin State Hospital for the Insane, Mendota, Wisconsin, September 16 and 17, 1897.

The following members were present: A. L. Warner, R. M. Phelps, Emily F. Wells, Viola French, S. F. Mellin, George Boody, George A. Post, Irwin H. Neff, Frank I. Drake.

The following applicants for membership were present: Dr. A. F. Lemke, Prof. W. O. Krohn, and Dr. Samuel Dodds.

First Session.—September 16, 8.45 p. m.

Dr. Geo. A. Post, president, called the meeting to order and introduced Dr. Lyman, superintendent of the Wisconsin State Hospital, who gave an address of welcome, supplementing his address with an account of the Wisconsin method of treating the insane.

The minutes of the fourth meeting of the Association, held at the Eastern Michigan Asylum, Pontiac, Mich., December 3 and 4, 1896, were adopted as printed in the issue of the American Journal of Insanity of January, 1897.

The secretary then made the following report, which was accepted:

"At the last meeting of the Association the attendance was not as anticipated, and with one exception, was local. This apparent drawback has received attention before. In addition to the reasons mentioned at the previous meeting, it should be remembered that this was the second meeting of the year, and this doubtless prevented a representative attendance. Notwithstanding that the attendance at the meetings has not been as hoped for, the interest in the Association has not abated. The one essential point requiring our consideration, namely, how to

secure a larger attendance, is before us and demands solution. Individual work is also essential. It would appear that the adoption of special work, as outlined by one of our members, would extend the interest from meeting to meeting; therefore, if practicable, such work should be assigned. The meeting of the Association twice annually would seem impracticable, and undoubtedly annual meetings would permit of the attendance of more members. It is unnecessary to say that, as heretofore, the Association needs the active work of each member."

The following report of the Treasurer was accepted:

Receipts.—Dues for Membership		$52 00
Expenditures.—Stationery and books	$ 95	
Telegrams	4 04	
Printing programs	7 00	
Postage	19 03	
Expressage of papers	30	
Stenographer's services	22 78	
Total	$54 10	—$54 10
Deficit		$2 10
Deficit from previous meeting		4 45
Making a total deficit of		$6 65

The following persons were elected to active membership: Drs. C. D. Morris and C. B. Chapin, of the Eastern Michigan Asylum, Pontiac, Mich.; Prof. W. O. Krohn and Dr. A. F. Lemke, of Illinois Eastern Hospital, Kankakee, Ill.; Dr. Samuel Dodds, Illinois Southern Hospital, Anna, Ill.; Dr. Minerva Newbecker, Nebraska Hospital for the Insane, Lincoln, Neb.; Dr. W. F. Wilson, Home for Feeble-Minded, Faribault, Minn.; Dr. Wm. L. Russell and Dr. Wm. Steinach, Willard State Hospital, Willard, N. Y.; Dr. Anne Burnett, Dr. Charles F. Applegate, and Dr. Alfred T. Gundry, Hospital for the Insane, Clarinda, Iowa.

Elected to honorary membership: Dr. William B. Lyman.

The following officers were elected: President, Dr. Geo. A. Post; vice-president, Dr. George Boody; secretary and treasurer, Dr. Irwin H. Neff. Members of Executive Committee: Geo. A. Post, George Boody, Irwin H. Neff, R. M. Phelps, S. F. Mellin.

The report of the Committee for the assignment of work according to a plan adopted at a previous meeting was accepted, and after discussion, assignment of work was requested.

Motion carried that the president appoint a committee of two for the completion of plan and assignment of work. The president appointed Drs. Neff and Phelps.

Dr. Phelps moved that the meetings be held annually. Motion carried.

The committee appointed to report as to the feasibility of limiting the membership to certain States reported unfavorably. Committee discharged.

Dr. R. M. Phelps read a paper entitled "Imbecility an Element in Insanity." Discussion: Warner, Dodds, Wells, Neff, and Boody.

Dr. George Boody read a paper on "Pure Cocaineism." Discussion: Neff, Warner, Dodds, and Phelps.

Dr. E. F. Wells read a paper by Dr. V. Podstaka, entitled "The Early Diagnosis of Paretic Dementia." Discussion postponed.

Adjournment at 11.30 P. M.

SECOND SESSION.—SEPTEMBER 17, 10.00 A. M.

Discussion of Dr. Podstaka's paper by Neff, Warner, and Phelps.

Prof. W. A. Krohn read a paper entitled "The Relation of Laboratory Psychology to the Study of Insanity." Discussion: Warner, Neff, and Boody.

Dr. A. F. Lemke read a paper entitled "A Report of a Case of Tubercles of Brain, with Some Remarks on Psychical Changes Occasioned by Brain Neoplasm." Discussion: Boody, Phelps, and French.

Dr. S. F. Mellin read a paper entitled "Report of the Ophthalmologist at Willard State Hospital for One Year." Discussion: Boody, Warner, Neff, and French.

Adjournment at 12 M.

THIRD SESSION.—SEPTEMBER 17, 2.00 P. M.

Dr. Irwin H. Neff read a paper on "Staff Meetings in Hospitals for the Insane." Discussion: Mellin, Wells, French, and Phelps.

Dr. R. M. Phelps read a paper on "Classification Based on

Clinical Lines, Combined with a Tabulation of Clinical Data." Discussion: Mellin and Neff.

Dr. Samuel Dodds read a paper entitled "The Advantages of Cottages in the Treatment of Certain Cases." Discussion: Mellin, Neff, Phelps, and Boody.

Dr. George Boody read a paper entitled "Report of an Autopsy," with exhibition of photographs.

Owing to limitation of time, a paper by Dr. Irwin H. Neff, entitled "A Syphilitic Case, with Post-mortem," was read by title.

The selection of a place for the next meeting, to take place during May, 1898, was left to the Executive Committee.

Adjournment at 4.00 P. M.

IRWIN H. NEFF, Secretary.

Medico-Legal Notes

By H. E. ALLISON, M. D.,

Medical Superintendent of Matteawan State Hospital.

MODIFIED RESPONSIBILITY.—A case has recently come before the courts wherein an uneducated deaf mute was accused of crime; being unable to read or write, and having no knowledge of the sign language, he was thus without means of communication with counsel and could plead neither guilty nor not guilty. He could understand very little, and that only through persons who had known him for years. As he was consequently deprived of his legal prerogatives, he could not be tried. The question was raised as to his capacity with reference to a knowledge of right and wrong, and as a result he was declared irresponsible. His intellectual and moral faculties were entirely undeveloped. In the English law a deaf mute is presumed to be an idiot; but, as to any particular case, this presumption may be rebutted. His responsibility may be shown by proving that he has been educated in special schools, that his moral sense has been developed and that he has a knowledge of right and wrong. If these facts are not made to appear in evidence, the presumption stands and he is classed among the insane.

In 1871 a similar procedure was followed in the State of New York. An indictment for murder in the first degree was pending against B.; and the court having inquired into the defendant's sanity, found him to be an uneducated deaf mute and thereupon committed him as a lunatic to a State asylum.

B., at the time of the commission of the crime, was twenty-five years of age and was one of two illegitimate brothers born of a negro mother. He was active and industrious, cheerful when not crossed, but possessed of a quick and violent temper, and, having been reared at the county almshouse, was wholly uneducated.

His mind was in the undeveloped state of young childhood.

Early in life he was bound out to a wealthy farmer, with whom he lived. Becoming enraged at the loan to a neighbor of a yoke of oxen to which he was much attached, he killed his employer by splitting open his head with an axe.

He has now remained in custody for twenty-six years. During the early part of his confinement he was subject to sudden outbursts of anger whenever he fancied he had a grievance. His petulant temper rendered him unreliable, but as time passed he became less ungovernable, and during recent years he has been a very competent teamster about the farm; never trusted alone, but in company with some one who understands him, he is able to perform a full day's work with his team, and is a strong, willing and useful laboring man.

Such cases illustrate what is sometimes termed "modified responsibility," as shown in idiots, imbeciles, deaf mutes and others. Crimes of a less serious nature than homicide are often committed by them, and the degree of responsibility is a question that may properly be determined by a jury. The defendant may be committed with justice, as circumstances require, either to an institution for feeble-minded children; to a custodial home for idiots; to an industrial or to a special school; to prison, or to a hospital for the insane. An honest difference of opinion may arise as to the degree of moral and intellectual development and consequent knowledge of right and wrong possessed by any such individual. Whether he shall be judged by the standard of a child's development or by that of a man's is often a question to be determined by evidence at the trial. The fact that such defectives often possess proclivities for committing unlawful acts may show simply a lack of educational advantages and is not necessarily indicative of ingrained criminal traits. They are governed largely by habit and can easily be trained. When such cases come before the criminal courts they only forcibly illustrate what the medical profession, and especially the alienist, has long advocated, namely, that the status of the individual should be carefully considered in examining every problem of crime.

The personality of the man should weigh largely as a factor in determining what disposition to make of him; whether to commit him to an educational institution, to a reformatory, or to a hospital for the insane. His future liberation should depend

upon his development and advancement along educational lines, intellectual, industrial and moral. It is not just to commit all such offenders to prison for a fixed term of years, nor to send them all to lunatic asylums to remain until recovery takes place, which procedure in the case of imbeciles would practically amount to life imprisonment. They should be held until, in the judgment either of the court or of some competent authority, it is proper to release them. In other words, they should be looked upon as court patients are regarded in England, namely, as "Queen's pleasure" lunatics. In dealing with the defective and the degenerate classes, justice should be tempered with wisdom and mercy.

The medical profession is interested in all matters which concern physical and mental non-development. Where a criminal habit has not become fixed and age will permit, each offender should be placed in an environment best suited for his development; the imbecile in a school for feeble-minded children; the blind and the deaf in special schools; the idiot in a custodial home; while the habitual criminal and the dangerous and homicidal insane should be kept in secure and permanent custody. At the same time there should be secured the greatest personal liberty of the individual consistent with the reasonable safety of society, otherwise our charitable and penal institutions will become vast receptacles, filled with an overflowing population without educational or reformatory influences and destined to increase the evil they seek to remedy.

Notes and Comment

THE RELATION OF THE MENTAL NURSE TO THE NURSING PROFESSION.—Dr. T. Outterson Wood contributes to the *Journal of Mental Science* (July, 1897) a paper upon "The Asylum Trained and Certificated Nurses of the Medico-Psychological Association," showing briefly the results of the nursing reform in Great Britain, and discussing some problems of general interest which are likely sooner or later to need solution by American institutions. The British Association in its relation with this great question of trained nurses, writes Dr. Wood, is "face to face with an unequivocal success." The asylum service need be no longer a matter of concern, but the present conditions suggest three questions: 1st. What is the present position the mental nurses hold among nurses generally? 2d. What steps can be taken to improve their status? 3d. What is the position of the qualifying body for these nurses in relation to the public? In considering these questions Dr. Wood refers to the struggle to secure recognition for the nurses of the Medico-Psychological Association by the general medical and surgical nurses of the Royal British Nurses' Association, and the opposition of the latter to such recognition. This hostility arose in part from the popular conception of a mental nurse (probably justified by the pretensions of occasional discharged and incompetent employees) as possessing but one quality worthy of mention—"courage to tackle a violent lunatic." Dr. Wood refers to the acknowledgment now made by many competent authorities that no "nursing curriculum is more uniform or practical, and no standard of examination is higher." He urges the affiliation of the nurses of the Association with some large general nursing association, and believes it to be the duty of the Medico-Psychological Association to assist those holding their nursing certificates when entering the field of private nursing.

Although it is probable that local differences will hinder for

a long time the development of the nursing service in this country to the state of perfection rendered possible by the more favorable conditions or the necessities of England, anticipation of the ultimate results will materially influence the systematic work of organization, and justifies careful study of the facts set forth by Dr. Wood. The inference is that the only guarantee of success in the management of a training school lies in the broadest conception and treatment of the subject. This was shown in the discussion led by Dr. Wise at the last meeting of the Association, and reported in the July JOURNAL. It has been repeatedly demonstrated that lectures to attendants for the selfish purpose of securing a better ward service do not constitute a school for nurses, that all such tentative and spasmodic efforts have terminated in failure, and that training in mental disorders without a foundation of instruction in bodily nursing will not produce a nurse fit for any service. It has likewise been demonstrated that hospitals for the insane have the material and the opportunity to provide the essential general training whenever they have set aside the bodily sick in separate hospital or infirmary wards under the direction of properly qualified instructors. Graduates from such schools in many instances have entered into successful competition with graduates of general hospitals. It has been further stated by a superintendent of nurses of large experience in both fields that there is great need among general nurses of instruction in the nursing of mental cases, and she suggests the propriety of a course in a hospital for the insane before the certificate of proficiency in nursing is conferred.

The time has come when some general agreement upon a standard of qualifications must be reached, and the best interests of the service require that only the highest ideals and the best results should be sought to be attained. For the accomplishment of this the Association is the most appropriate body.

The benefits to be expected of such action have been summed up by Dr. Cowles:

"There is no one thing that could now be done in regard to them (hospitals for the insane) that will yield so much direct benefit to the patients, profit to the hospitals in furthering their prime purpose of curing the sick, and benefit to the State in promoting the welfare of its citizens by the diffusion among them of

this education, as the establishment of such schools in all such hospitals."

OUT-PATIENT DEPARTMENTS OF MENTAL DISEASES.—The establishment of a Department of Mental Diseases at the Boston Dispensary has been announced, the organization having been completed by the appointment of Dr. Walter Channing in charge of the department, with Dr. Arthur C. Jelly as assistant. "It is believed that the department can be of considerable service to the dispensary physicians and the friends of patients by giving them information in regard to the necessary steps to commit patients to hospitals. It will be the desire of the physicians of the new department to do what may be possible to bring about a more clear and definite recognition of mental diseases before they become fully developed cases of insanity."

The JOURNAL (October, 1893) has noted the establishment of similar departments in connection with the out-patient services at St. Thomas' Hospital, London, and at the Pennsylvania Hospital. In the latter, the "physicians of the Department for the Insane attend for the purpose of giving advice and imparting information to persons who are suffering with supposed premonitory symptoms of mental disease. Many have been cured or relieved by timely aid and saved a prolonged stay in some hospital."

At St. Thomas' Dr. Rayner has been in charge. The service has been an active one, and the need of it has been amply demonstrated. Dr. Rayner believes that not the least of the benefits has been the "medicalization" of incipient cases of insanity, and the reference of the minor ailments of these cases to the various other special departments has aroused the general interest of the staff of the hospital, and has attracted greater attention to the possibilities of treatment.

BERI-BERI AT THE RICHMOND ASYLUM.—The JOURNAL has from time to time during the last few years recorded outbreaks of this distressing disease at the Richmond Asylum, and again notes its increasing severity. In an editorial leader in the *Dublin Daily Independent* of August 4, last, this epidemic and a widely quoted contribution to the *Westminster Review* bearing more or less directly upon it, are discussed as follows:

"The Governors of the Richmond Lunatic Asylum were called together again yesterday for the purpose of considering the congested state of the institution, and the alarming epidemic of Beri-Beri which now exists as a consequence of overcrowding. The report of their proceedings contains no novel information, except that the number of Beri-Beri patients has increased to 150. For months, nay for more than a year, the Governors have discussed the kindred topics of overcrowding and Beri-Beri, but a solution of the difficulty seems to be as remote as ever. We do not blame the Governors in the remotest degree. The only complaint that can be alleged against them is that they have exhibited the most extraordinary patience under very trying circumstances. Patience, however, is a virtue which has its limits, and we candidly think that the utmost limit has been reached. The state of things in Richmond Asylum is as bad as bad could be, and if the Governors are not given a free hand to deal with the crux as they are advised by eminent professional authorities, there is no other course open to them but to throw the responsibility over on the Government Department. the Board of Control, a body which is undoubtedly chiefly responsible for the position of affairs to-day. As our readers know, overcrowding and Beri-Beri in the Richmond Lunatic Asylum are not questions of to-day or yesterday. The facts have been exposed in our columns month after month for a very considerable period. To-day there are in the Asylum 550 patients for whom there is no proper accommodation! Is it any wonder that Beri-Beri, a disease which thrives on overcrowding, has been epidemic almost continuously since 1894? But the Board of Control, who are masters of the situation, will do nothing but obstruct. The Portrane Asylum will not be ready for occupation for five or six years, and even the temporary buildings for the relief of the Richmond Asylum are not making anything like the progress anticipated. In the meantime what is going to happen? The health of the city is endangered by the close proximity of a dirt-disease which it is always difficult to eradicate once it takes a hold. In face of this grave danger the Board of Control will do nothing, and all that the Governors can do is to propose to send a deputation to the Lord Lieutenant to request the temporary use of the Grangegorman Female Prison,

which has been already refused by the Government. If this makeshift fails we really do not see what more the Governors can do except hand over the Asylum, with its 1650 inmates, including 150 Beri-Beri patients, to the Board of Control, who are masters of the people's money without being amenable to public influence.

"The bungling and callous indifference of the Board of Control, the irresponsible body who have charge of Irish Asylums, would go far in itself to justify the outspoken and closely-reasoned article by Mr. W. J. Corbet, M. P., in the current number of the *Westminster Review*, entitled 'Plain Speaking About Lunacy.' Mr. Corbet deals with the increase in the number of inmates of lunatic asylums, and he once again accuses the Lunacy Authorities of attempting to show that the increase is only apparent and not real. Evidently whether the Irish Board of Control regard the increase as apparent or real they are in no particular hurry to adopt measures for coping with it. Mr. Corbet's accusation against lunacy officials—that is, those in supreme control—is that they are content to perform their duties in a merely perfunctory manner, without paying due regard to the interests of the public or facing boldly the problem of the increase of insanity. The member for East Wicklow makes out a strong case against the Lunacy Board of England and Wales—a stronger case, we venture to think, than any which he has made out yet. Taking the official contention that 'there is no material increase in insanity out of proportion to the increase of population,' he proves from the official reports themselves that there has been an actual increase in the numbers of the insane, between 1859 and 1895, far beyond the double, 'while the ratio of the insane to sane has concurrently nearly doubled also.' This being the case, it is hard to give credence to the contention that the increase is due to accumulation consequent on greater longevity in asylums, coupled with a decrease in the recovery rate. It is quite true that asylums are more healthy now than they were in 1859—always excepting the Richmond Lunatic Asylum—but while this fact may account for some of the increase since 1859, it surely cannot account for the 'continuous increase annually,' when we consider that the death-rate in the asylums to-day is not more favorable than it was a decade or two ago. If the official contention as to accumu-

lation were correct, it would almost mean that in these latter days lunatics do not die at all! Mr. Corbet shows conclusively that where the lunacy authorities err is in closing their eyes to the terrible fact of heredity as a factor in the increase of insanity. He quotes authorities to show that heredity is a prime cause of insanity, and he discusses, without offering an opinion of his own, the suggested remedy for an evil which is filling our asylums to overflowing, and to which the responsible authorities will not open their eyes. Of this there can be no doubt whatever that Mr. Corbet, M. P., has made out a clear case for the appointment of an International Commission of Inquiry into a subject which, as we know to our cost here in Dublin, is becoming more pressing and important every day. The state of things in Dublin is not an isolated instance of the increase of insanity entirely out of proportion to the increase of population, though it affords a very forcible argument in support of Mr. Corbet's general proposition. Insanity has increased in Ireland, while the population has decreased. It would be interesting to find out how the partisans of the theory that the increase is apparent and not real reconcile this undoubted fact with their pet idea—an idea which Mr. Corbet, more than any other man, has most vigorously and effectively attacked."

The Discoveries of Prof. Elmer Gates.—Many of our readers have doubtless seen statements in the daily papers regarding certain great improvements in the microscope and telescope said to have been made by Prof. Elmer Gates, of Washington. An authoritative statement by the discoverer himself appears in the *Medical Times* of November, 1897. The gist of the discovery lies in substituting for the outer lens, or what the Professor calls the "occular" of the microscope, another compound microscope, which is focused upon the optical image, thus magnifying it to a much greater extent than is done by the simple lens of the eye-piece. In this way he claims to make details visible which cannot be seen by the ordinary methods. As the illumination of an object so highly magnified is necessarily very feeble, the light from the object being spread over such an immensely greater surface, he resorts to photography, and by the cumulative effect upon the plate of small amounts of light acting through a long time succeeds in photographing such an image, in the same way

that stars may be photographed which are invisible through the telescope used for the purpose.

There would seem to be no optical difficulty in obtaining and photographing such enlargements as are described, but when he claims, as we understand him to do, that by thus using, for instance, a microscope of a magnifying power of 600 diameters, as much additional detail is revealed as is brought out in the first instance by directly viewing the object with a miscroscope of that power, the statement seems to us to involve serious improbabilities.

It is well known to all microscopists that, although it is easy to enlarge the apparent size of a microscopical object by using higher eye-pieces, beyond a certain limit nothing is gained in the amount of detail that can be seen. The reasons for this, as we understand them, are two. In the first place, any optical defects in the objective blur a small image much more than a large one. If there is any blurring of the outlines, it is actually as great in the case of a small object as of a large one, but proportionally to the size of the image it is greater the smaller the object. If the indistinctness of an object as seen by a given power is due to a lack of sharpness in its outline, magnifying the image will magnify the defect in the same proportion, and therefore will make no improvement in the distinctness with which it is seen. In the second place, with a given lens, objects below a certain size do not, properly speaking, form any image at all. If their different parts are not far enough apart for the light coming from them to be focused at an appreciable distance apart, they are seen, if seen at all, as points, without definite shape. In such a case, magnifying the image would not increase the clearness with which that particular detail can be seen. It would hardly seem likely, therefore, that any results can be obtained commensurate with the amount of work involved in such delicate manipulations.

He also claims to have succeeded, by a new method of section-cutting, in producing sections of about one one-hundredth the thickness of any heretofore made. As he elsewhere states that, by means of the use of light of proper wave-length, he can see a short distance beneath the surface of most opaque objects, and, for instance, see a muscle cell in his finger through the three layers of the skin, this would almost seem superfluous.

When a person makes extraordinary claims which seem, upon their face, improbable, it is natural to inquire what have been his previous achievements. If it appears that he has already succeeded in accomplishing what seemed to be impossible, we are more inclined to give credit to what may seem surprising statements in regard to other matters. Fortunately, we are not left in the dark in that respect in regard to Prof. Gates. We have not discovered from what institution of learning he holds his title, but in an article of thirteen pages in the December number of the same journal he announces a series of discoveries from which it would appear that the improvements with which he expects to revolutionize all the branches of science dependent on the microscope and the telescope are but insignificant episodes in the astounding achievements of his intellect. Space will only allow us to mention briefly some of the more important points.

He has discovered an "art of mentation," by means of which he has been enabled to increase his mental capacity, and to augment the quantity and quality of his originative work in invention and research. From this have resulted all his other discoveries.

He has discovered and developed six new departments of psychological research, namely, Biologic Psychology, Subjective Biologic Psychology, Sociologic Psychology, Psychologic Biology, Subjective Psychologic Biology, and Sociologic Biology.

He has devised a method of "brain-building," of which he says: "Suffice it to say, the evidence is complete which demonstrates that every mental activity creates a definite chemical change and a definite anatomical structure in the animal which exercises that mental activity, and that this is the *modus operandi* of animal growth and evolution, and that by this method more mind can be embodied *ad libitum*." By this means he can cure immorality by developing a large and dominant number of normal cells in the very areas in which the evilly functioning cells were, and keeping them functionally active for a longer period each day than the evil ones have a chance to be active.

He has established, to his own satisfaction, "that life and vitality and physiologic processes are simply and solely mental processes. . . If we can know how to regulate mind-processes, then we can cure disease—all disease." As he says elsewhere, "Hence this paper may be considered to contain a first statement

of a scientific and fundamental law of cure, to be hereafter elaborated and rendered more definite by a series of most interesting experimental researches."

We will not delay to mention various other discoveries which the author mentions incidentally, any one of which would be enough to immortalize its originator. Enough has already been said to show that if the Professor's statements can be accepted, all the achievements of human genius hitherto sink into utter insignificance in comparison to what he has been able to accomplish by his own unaided powers. To have devised means to produce mind *ad libitum*, to extirpate all immorality and cure all disease are achievements of which it is impossible to speak hyperbolically; the furthest reach of the powers of human expression must fall short of doing justice to the subject.

We can only trust that the Professor will so far apply his discoveries to himself as to preserve his life until the promised volumes on mentation and brain-building are before the public. Then, instead of awaiting the uncertain and sporadic appearance of men of genius, we shall be able to raise geniuses of any desired variety as we now can fatten oxen and swine. When that day arrives, nobody, not even Prof. Elmer Gates, will be indispensable.

Scottish Asylums from a South American Point of View.—Dr. A. Campbell Clark, of Glasgow, has kindly sent a translation of two interesting letters from Dr. Cabred, Professor of Mental Diseases in the University of Buenos Ayres, and Medical Superintendent of the Public Lunatic Asylum for men, which appeared in the numbers of *La Prensa*, an Argentine newspaper, for 20th and 22d July, 1896:

THE INSANE IN SCOTLAND.

Edinburgh, 8th June, 1896.

This country has had the honor of introducing into the general management of the insane, modifications of such importance as to constitute in their entirety a system to which is justly given the name of Scottish. The advances that have been made in this department of philanthropic administration began in the year 1857, when the wise lunacy law was promulgated which is at present in force, by which the supreme direction and supervision of everything referring to lunacy administration was centralized in a general council of inspectors of the insane. (General

Board of Commissioners in Lunacy.) This centralization of powers has given the best results, and it may be said that the commissioners have taken the initiative in most of the beneficent reforms which have been introduced into the general plans and internal regulations of asylums. These reforms are principally due to the efforts of Drs. Mitchell and Sibbald, two eminent alienists who have devoted about forty years to lunacy affairs. The General Board of Commissioners is composed of five members, of whom two are medical and two legal. There are besides two auxiliary inspectors, also medical, but who take no part in the deliberations of the board.

The treatment and care of the insane is in accordance with two systems, in public and private asylums, and in private houses. (Private Dwellings System.)

There are in the country at the present time twenty-six public establishments for the insane and only five private asylums. There are also several sections of institutions called poorhouses, in which tranquil, incurable, and inoffensive patients are received; and lastly there are two asylums for juvenile idiots, and a special section of the prison at Perth for what are called criminal lunatics. The public asylums are divided into Royal asylums and District and Parochial asylums.

The Royal asylums, seven in number, owe their existence to private donations and subscriptions, and are so called because they possess royal charters which secure their autonomy. The donations are in some cases so large as to suffice by themselves to establish an asylum, in which case, as in that of the Crichton Institution, the asylum bears the name of the donor, that asylum having been provided by the generosity of Dr. Crichton, who gave for this purpose a hundred and twenty thousand pounds sterling. The most important Royal asylums are that which has just been mentioned, and those of Morningside and of Montrose. The District and Parochial asylums are maintained by rates levied for the purpose in virtue of special enactments. There are thirteen of the first and six of the second category. The most important are Hawkhead, Woodilee, Hartwood, Stirling, Gartloch, and Perth.

Before discussing in such detail as it deserves the special management which characterizes the asylums of this country, it seems to me desirable to give a general idea of their material constitution, which will indicate at the same time the management adopted. The asylums are for both sexes, are almost always situated in the open country with large tracts of land adjoining, and some of them possess as many as three hundred or even four hundred hectares for cultivation.

The architecture adopted in the new asylums and in the additions made to the older asylums is similar to that of large private houses. Some establishments, such as the Crichton, Morningside, Hawkhead, and Gartloch, are so large and handsome as to give the appearance of baronial residences. Separate villas in the style of *chalets*, which bear the names of celebrated alienists, complete and beautify the group of buildings in many asylums. Some possess seaside villas of similar character, where

the insane stay for short periods for bathing. None of these buildings are surrounded by walls or have closed airing courts or stanchions in the windows, or anything that is suggestive of a place of confinement. For marking off parts of the grounds there are sometimes hedges or stone walls, but where there are walls they are so low that a child of six years old could get over them. All the asylums are surrounded by splendid gardens and parks, and in these last the patients engage with complete liberty in outdoor games, such as golf, lawn tennis, cricket, etc. And in these parks there may also be seen beautiful flocks of sheep.

The plan and general disposition of these magnificent edifices are subordinated to a principle of intelligent classification of the patients, which consists in their separation into four great groups, accommodated in the following sections: (1) the hospital, somewhat separate from the rest of the asylum, and reserved for the observation of patients recently admitted, for those of suicidal tendencies, and for those suffering from intercurrent maladies; (2) the pavilion for the curable; (3) the section for the chronic and incurable; and (4) the agricultural colony and workshops for the working patients. Besides these there are of course special sections for the administrative and general services. The pavilions consist generally of three stories, except the hospital, which has two stories. In the ground floor are the dayrooms, libraries, bathrooms, etc., and in the other two stories are the dormitories, attendants' quarters, etc. Excluding the patients in the hospital, who have a dining hall for themselves, the patients have all their meals in an immense dining hall, above which is the great concert room. The apartments are spacious, with large windows, and are decorated in refined taste. The walls are covered with engravings and oleographs, and at every step one meets with statuettes, terra cottas, vases and hanging baskets of flowers, and cages with birds, which all contribute to give an effect of beauty and cheerfulness. In some asylums I have counted as many as eight pianos. The furniture is simple, substantial and elegant.

But that which claims special attention in these establishments is the great amount of liberty which exists. The doors, both interior and exterior, are found open or at most fastened by a simple latch. From this circumstance and from the absolute absence of closed airing courts, of high walls, and of everything suggestive of confinement, has arisen the name of "open door" which is given to the Scottish system.

If we pass from this to examine the rest of the constituent elements of comfort, our admiration increases step by step, since no detail or improvement seems to have been omitted in the arrangements for lighting (electric in the majority of the asylums), for heating, for ventilation, for bathing, or for cooking, etc., etc.

It is evident that this admirable organization is attended with immense cost; and it is only a rich country, highly cultured, and where philanthropic sentiments are fully developed, that could arrive at such enviable results. The cost of all the public asylums of Scotland amounts to two million pounds sterling (thirty millions of our money). This information

is derived from an official return presented to the House of Commons in August, 1895, which gives the figures up to the end of December, 1893. Since 1893 there are in course of construction three new asylums, better still, if possible, than those that I have mentioned. It has to be noted as a mark of honor for the private charity of this country that more than the third part of this large sum corresponds to the cost of the asylums created by donations and contributions from private sources; and these are without dispute the largest, the most beautiful, and the most comfortable. We shall only indicate some details that will suffice to give an idea of their grandeur. The colonial section of the Crichton Asylum (Dumfries), for a hundred patients, with farmsteading, dairy, piggery, stables, barn, etc., has cost fourteen thousand pounds sterling, the chapel of the same asylum thirty thousand, its concert hall luxuriously furnished can conveniently contain six hundred persons. The total cost of the asylum (for nine hundred patients) is three hundred thousand pounds. The new part of Morningside Asylum, for two hundred, has cost a hundred and twenty thousand pounds, which is not to be wondered at, since it surpasses in convenience and luxury all known similar establishments.

The number of the insane accommodated in the different asylums amounted on the first day of the year 1895 to eleven thousand and seventy-two persons of both sexes, and the number provided for in private dwellings to two thousand seven hundred and ninety, which gives a total of thirteen thousand eight hundred and fifty-two insane persons, a high figure if we keep in view that the population of Scotland is only four millions of inhabitants, that is to say, more or less the same as our own country, which has only one thousand seven hundred in asylums. It is true that this number is much below that of the insane not in asylums, and who ought in justice to have official assistance. Having indicated in broad outline the physiognomy of the Scottish asylums, there remain to be studied their internal management and the admirable curative results that are obtained; but as this would require me to extend my letter considerably, and it is already somewhat long, I prefer to make it the subject of a second letter. I desire, however, before closing to record my profound gratitude for the very cordial reception given me by those distinguished alienists Drs. Sibbald, Mitchell, Clouston, Rutherford, Macpherson, Robertson, Watson, and Campbell Clark, who made the performance of my task so easy and agreeable.

(Signed) DOMINGO CABRED.

SECOND LETTER FROM DR. CABRED.

Edinburgh, June, 1896.

If, as I have said in my previous letter, the asylums of this country merit all kinds of praise from the point of view of their structural arrangements, their internal administration equally deserves to receive commendation.

The great amount of liberty granted to the insane is one of the most remarkable features of the Scottish system. Those patients whose mental condition permits can go freely through all parts of the interior of an asylum, the doors, as we have seen them, being open during the day or closed with a simple latch. The patients are likewise allowed to go into the gardens and parks for exercise and to engage in games in the open air, and they may even, with special permission, ramble over the extensive grounds devoted to cultivation; and lastly, they may be permitted to go out of the establishment alone to visit their relatives and friends. Some of those who go out on leave are sent under the care of attendants, and others go on parole given by the patients themselves that they will not escape and that they will return to the asylum within the prescribed time. This practice of allowing patients to go out on parole, special to the asylums of Scotland, is an important element of moral treatment and in no way compromises either the order or discipline of the establishments or the safety of the patients. We have been assured by the Scottish alienists that it also produces an excellent effect. It preserves and develops a certain sense of responsibility in the patients. It is more worthy of notice that the parole is seldom broken by the patients. Indeed it is not broken more frequently than might be observed in any aggregation of sane individuals subjected to discipline. A few days ago I had occasion to be witness of an incident which gave an illustration of these absences on leave. It occurred in the house of the learned alienist, Sir Arthur Mitchell. I met there at five o'clock in the afternoon a gentleman who was one of our party at tea and whose conversation and manner was in every respect correct. After a short time he looked at his watch and said in the most natural way, "It is time I was going back to the asylum." He took leave of the lady of the house and of me in the most courteous way and went away without being accompanied by any one. He was a patient from the asylum at Morningside who for a long time has been in the habit of taking tea with Sir Arthur. When the patients are not honorably faithful to their parole they are subjected to restrictions of liberty for some time, restrictions which have the effect of relegating them to sections of the asylum which they cannot leave, or of subjecting them to constant supervision when they go out for exercise or work. At first sight it might be supposed that this great liberty granted to the insane would result in all kinds of accidents and escapes; but, as has been stated, this is not the case. According to the statistics in the last Annual Report of the General Board of Commissioners, the number of accidents in all the asylums of Scotland was 112. Ten of these had fatal results. Only three were suicides, the remaining seven being due to accidental circumstances. The rest consisted of fractures of the limbs, injuries received in struggles, etc., always inevitable in large aggregations even when not composed of the insane. As regards the escapes, they have not for many years amounted to more than two per cent., and this does not greatly disturb the superintendents of asylums, as they consider they are made up for and with interest by the liberty

which the greater part of the patients enjoy. It is easy to understand, moreover, that a patient who sees that his liberty is not restricted, who finds himself surrounded with comforts and who receives kindly treatment, does not generally feel a desire to escape, as happens when he finds himself shut up in a closed asylum. Such enviable results are due, apart from what I have said, to the care with which the patients are selected to whom this large amount of liberty is accorded, and to the constant supervision exercised over those who really require it. This supervision becomes the more effective the more the attendants are obliged to concentrate their attention on their patients. When an attendant cannot rely on high walls, enclosed airing courts and locked doors, he has to study the character and the tendencies of the patient committed to his care, and he is converted into a companion and friend who has no means at his command except kindly behavior and persuasion.

A certain number of the attendants possess certificates that they have received adequate instruction, and these certificates are not given to any attendants who have not been a certain time in an asylum and have performed their duties in a meritorious manner, and after they have passed a serious theoretical and practical examination on the mode of treating the insane. They constitute a body of the greatest importance as auxiliary to the medical staff. I ought to mention in this connection an interesting circumstance that I observed in some asylums, the nursing of male patients in the hospital section being entrusted to women, with whose carefulness and efficiency the superintendents are highly satisfied. The proportion of attendants is for the acute cases one for every five patients, and for the chronic one for every ten. The instruction of the attendants is under the patronage of the British Medico-psychological Association, to which all the medical superintendents of asylums belong and which publishes books for the purpose of such instruction. The remuneration of this class of attendants is high, and goes on increasing with the number of years of service. The ordinary attendants receive from three to five pounds sterling a month, and the head attendants from four to eight. Indeed all members of the staff of the asylums are well paid, beginning with the superintendents of Morningside and the Crichton, who have yearly salaries of two thousand pounds. Finally, when speaking of the *personnel* of asylums, I should not omit to mention that besides the superintendents there are in all the asylums several resident assistant physicians in the proportion of one to every hundred patients. These resident medical officers who devote themselves to the specialty of psychiatry form a special class, in which promotion is usually based on years of service, and they render most valuable assistance to the superintendent in his multifarious duties. The assistance furnished by these physicians is, of course, infinitely superior to that which can be given by resident students, who are really birds of passage in asylums for the insane.

The organization of labor has for a long time received very great attention on the part of asylum superintendents, as they are convinced of its capital importance as an element in moral treatment, as a means of

preserving discipline, and as a source of economy. The principal occupations in which both pauper and private patients are employed are such as can be engaged in out of doors, such as agriculture and gardening, but some are employed at such occupations as tailoring and shoemaking. The women are employed chiefly in the kitchen and laundry, and at needlework and household duties. The proportion of workers in pauper asylums is about 70 per cent. for men and 50 per cent. for women. Among private patients there are only about 38 per cent. for both sexes. It is calculated that the value of the work of a useful patient amounts to the half of the cost of his maintenance, which is on the average a shilling and sixpence per day.

The comfort which is to be seen in the asylums is very great, as I have already indicated when treating of their structural arrangements. The food is abundant and of good quality, and at meal-times it is very gratifying to see, gathered in the commodious dining halls decorated with flowers and plants, patients of both sexes seated at the same table in the greatest order and tranquillity, and it is no less agreeable to see the two sexes mingled at the concerts, the dances, and at the out-door games. These recreations in association are very frequent, and they constitute a precious element of moral treatment, as they tend to preserve habits of social courtesy.

Besides the principal features of the reform by which the Scottish system of lunacy administration has been so profoundly modified in its material and moral aspect, there remains to be indicated the curative results that have been obtained. The average number of recoveries during the last ten years is about 40 per cent., and the mortality during the same period about 8.30 per cent. Figures so consolatory in regard to mental disorders where the prognostic is so grave constitute the best eulogium that can be made on the Scottish system, especially if account is taken for an equal period of time of the statistics of the closed asylums of France, Italy, Spain, and other countries, which show a much lower number of recoveries and a higher mortality.

The conclusion from the above exposition is that the Scottish asylums have realized the desideratum to which Esquirol gave expression in the first third of the present century in respect to such institutions, since they have been converted from being mere places of confinement to veritable instruments of cure. For all this I have congratulated the distinguished alienists who are in the front rank in the branch of the public service devoted to the care of the insane in that beautiful country, and I venture to hope that no long time will elapse before we shall see realized in our own land the achievements that I have had occasion to admire.

DOMINGO CABRED.

THE PRATT BEQUEST TO THE SHEPPARD ASYLUM.—Few American communities can point to a munificence of public bequest equal to that which has characterized the giving of prosperous,

benevolent and enlightened Baltimoreans. Johns Hopkins, Moses Sheppard and Enoch Pratt are but types among a multitude of givers whose benefactions have shed lustre upon a fair city. Happy Baltimore! There is withal in her good works, notwithstanding an incomparable vastness of reach, a singular unobtrusiveness of spirit that seems to spring from that grand postulate of olden time, *noblesse oblige*.

Moses Sheppard shrank from the use of his name in the title of the great hospital near Baltimore which he created. He thought, as he wrote to a friend, that he could "proceed unnoticed." "I want no such monument to my living fame," was his protest, although he finally gave a reluctant assent. Quaker that he was, he despised seeming and show, and cared not for the modern public marking system that is so subversive of public morals. A great educator has warned us that men and women whose chief anxiety is to make a show before the world, who strive for "marks" in public estimation or notice in public prints and are not over-conscientious about the manner in which these things are obtained, can hardly help being in all ways selfish and unreliable. And yet, we submit, it is not selfishness to give an institution its founder's name, even though that name be prescribed by the founder himself, but an act of wisdom. After all, we may perhaps discern in such naming the same motive that in days of chivalry actuated the conferring of knighthood upon valiant and worthy men. "Equitee willethe and reason ordeniethe," so read the patent, "that men vertuous and of noble courage be by their merytes and good renoune rewarded and had in perpetuall memory for theire good name and to be in all places of honner and wourshippe among other noble parsons accepted and reputed by shewinge of certain ensignes and tokens of vertue, honner and gentelnes to thentente that *by their Insaumple others shulde the more perseverantly enforce themselfes to use theire tyme in honorable wourkes and vertuous dedes.*" This sentiment indeed is based upon yet higher authority, for are we not enjoined for the like purpose to let our "light so shine before men"? These reflections are not without bearing upon the bequest of the late Enoch Pratt of Baltimore to the Sheppard Asylum. This institution, already well equipped by endowment for the care of a limited number of the insane, is, by the terms

of Mr. Pratt's will, made his residuary legatee upon the sole condition that the name of the corporation now known as "The Trustees of the Sheppard Asylum" be changed to "The Trustees of the Sheppard and Enoch Pratt Hospital." This change would involve an amendment to the charter to be authorized by the General Assembly of Maryland. No other condition was imposed except the stipulation that the income only of the funds he devised to his residuary legatee shall be used in the same manner as was prescribed by Moses Sheppard. Enoch Pratt directed the erection of buildings for not less than two hundred additional inmates and the reception at the hospital of the *indigent* insane at "very low charges or absolutely free." When it is learned that his bequest amounts to sufficient, when added to a "very low charge" from those able to pay, to maintain two hundred insane "in the most advisable manner," one rejoices at the windfall that places the Sheppard Asylum prospectively in such an enviable position of enlarged usefulness and gives it the name of Hospital. But this jubilant feeling changes again to one of amazement when a doubt is intimated by some of the institution's friends whether the acceptance of the bequest under the new title as proposed and required under the will, would not in some measure dim the lustre of Moses Sheppard's gift—of the man who desired "to proceed unnoticed"! We confess that to us it seems a gnat-straining spirit to exhibit in the presence of a gift of such vast possibilities for good to the State of Maryland. Certain it must be that Moses Sheppard would have welcomed a conjunction of title that accords well with his own sense of greater modesty as expressed in his written words. To believe otherwise is to impugn alike the sincerity of his utterance and the object of his gift. The JOURNAL hopes and believes that the broader view will obtain and that the General Assembly of Maryland will in its wisdom, by amending the charter as proposed, make it possible for the Board of Trustees to enlarge the existing asylum into the greatest hospital for the care and cure of the insane that has ever been reared on American soil. Great because founded upon the broad principle of "improving" the care of the insane, because conducted by a board which is in earnest sympathy with the motive of the founder, and is untrammelled by conditions except such as are intended for the good of the insane now and

in the future. In the words of Enoch Pratt, here the acute insane, whose friends cannot pay for the full cost of their care or for any portion thereof, can under these combined endowments, be cared for "in the most advisable manner." Then, indeed, will Moses Sheppard and Enoch Pratt not be linked as to name merely, but bound inseparably in memory as equal benefactors of a class of sufferers whose needs cannot be too bountifully supplied.

THE AFTER-CARE MOVEMENT.—At the Baltimore meeting of the Medico-Psychological Association a committee was appointed to co-operate with a similar committee on behalf of the American Neurological Society to devise some system of after-care for patients discharged from institutions for the insane. At the time of the appointment of these committees it was anticipated that the whole matter would be brought before the Conference of Charities at its annual meeting in Toronto for concerted action on the part of alienists, neurologists and philanthropists generally. Owing to the fact that the movement was initiated at too late a date, nothing definite was accomplished, and the combined action hoped for must be deferred until another year. Meantime, it is gratifying to read the conclusions of the report of Drs. Stedman, Dana and Dercum, the committee appointed by the American Neurological Association, and to know the keen interest which the scheme has excited.

"First. It is the general and well-nigh unanimous sentiment of those who are the most conversant with the needs of the insane in this country that measures should speedily be inaugurated for the temporary relief of discharged recovered convalescent and improved insane patients of the dependent class by organized outside assistance.

Second. As a preliminary step, inquiry should be made of all such patients before they leave the hospital, regarding the mode of life, surroundings and occupation to which they are returning, and appropriate advice given by a medical officer of the hospital. This precautionary measure is, we believe, too often neglected in large institutions for the insane.

Third. The legal provision, whereby an allowance of money and clothing is made in some States to each patient on his discharge, should be adopted by all.

Fourth. Outside assistance can best be provided, we believe, through the medium of an after-care association which, until its utility be proven,

should be entirely a private undertaking, and should be organized like most existing charitable associations depending upon voluntary contributions. Obviously, a large city offers the best field for starting and developing such a system.

Fifth. The special methods of after-care relief by such an association should be those employed by similar organizations in other countries: England, France, Switzerland, or a selection of the best methods of each; these may be modified later to meet special conditions.

Such relief should, at first at least, be extended only to the class mentioned, and be understood as temporary, covering only the first month or two following the patient's discharge. The work may be best done by associates or agents appointed for the purpose, who shall find suitable homes and situations for all proper cases. There should also be systematic supervision of the homes by agents for the time specified or until the patient seems to be under good conditions for taking up life and work again. This applies also to patients returning to bad surroundings in their own homes. Reports should be made and records kept of each case.

Sixth. We believe it a duty that is especially incumbent upon this Association to take up in this way the work of the hospital physicians, and to see that the good accomplished in institutions be supplemented by proper outside supervision in appropriate cases; and we would urge its members to actively engage in the formation in their respective States, of relief associations for the after-care of insane patients of this class on their discharge from hospitals, and to endeavor to enlist in the work of co-operation all friends of the insane so far as practicable. To facilitate this, your Committee would suggest that a brief compilation from all available sources of the methods employed by such organizations abroad be authorized and published by the Association for distribution to all who are interested in furthering this work.

Seventh. Regarding State convalescent homes, there is abundant evidence of the most authoritative kind of the advantages to follow from their establishment, but, in our opinion, the first reform in the order of precedence should be the general recognition of the necessity of separate hospital treatment of insanity in its early and active stage, and the actual adoption of special provision for the "acute" insane as an indispensable step in the hospital treatment of public insane patients. Only when this result is reached should separate establishments exclusively for convalescents be added to the already large burden of expense for our dependent insane."

PATHOLOGISTS IN HOSPITALS FOR THE INSANE.—None of our readers can be ignorant of the fact that it has been rather fashionable of late years, in neurological circles, to reproach the hospitals for the insane of this country with the smallness of their contributions to the scientific side of the study of the class of patients

with which they are especially concerned. Although we do not think that sufficient allowance has, in all cases, been made for the difficulties of the subject, it can hardly be denied that there is some apparent justification for such strictures. Whether as a result of the application of the goad, or of a spontaneous awakening to the importance of the subject, there is evidence at present of a disposition to remove this occasion of reproach by the employment, in many institutions, of persons charged with this special duty. We believe this movement is calculated to be of great benefit to the interests of the insane. At the same time, the appointment of a person for this purpose, even if he is thoroughly competent, will not in itself be sufficient to secure all the advantages which are to be reasonably expected from it. Assuming that a suitable man has been selected, it is worth while to consider, for a moment, under what conditions he can do his best work.

The time is past, if it ever existed, when pathology could be supposed to be concerned merely with *post-mortem* conditions. Important as is the study of the changes produced in the organs and tissues by morbid processes, it bears about the same relation to the whole subject of the investigation of disease that the inspection of the premises after a burglary does to the catching of the thief. It is no more pathology than is clinical observation, or investigation into the etiology of disease. Every physician should be, in one line or another, a pathologist, and the pathologist *par excellence* will only be able to do his best work in association with other interested and intelligent students of disease. If the physicians who attend immediately upon the patients are ignorant, indolent, or overworked, if the patients are superficially observed and the clinical records ill-kept, the usefulness of the pathologist, however competent he may be, will be very much limited. If his time is taken up to any great extent in the routine examination of urine, sputum, and blood, and other similar work which any physician ought to be competent to do for himself, it is encroached upon to that extent for purposes of original investigation, and if the other members of the staff shirk such work because they have a pathologist, it may be worse for them, as well as for their patients, than if he were not employed.

It will, then, be for the advantage of the pathologist to enlist,

so far as may be, the interest and co-operation of the other members of the staff. To consult with them, clinically, over interesting cases; to give them the benefit his greater leisure for reading, and, it may be, better acquaintance with foreign languages, in matters of practical utility; to engage their assistance in laboratory work, will not only benefit them, but add to the value of the data from which he has to work.

No one should be selected for such a position who does not show some interest in, and capacity for, original research. These and industry being given, an investigator should be allowed to follow his own bent, without being called to account because he is not able to report some startling discovery every year, or because he is not working on just the same line with some one else who is doing good work. The field is broad enough to give scope to the most varied tastes and talents, and a man who is fit for such work is likely to be a better judge than any one else of what he can do to the best advantage.

QUIS CUSTODIET IPSOS CUSTODES.—At the recent Conference of Charities held in Baltimore in November last, a portion of one day's session was given up to a discussion of the care of the insane and the mentally defective.

Dr. P. M. Wise, President of the New York State Commission in Lunacy, delivered an address upon "State Care of the Insane," which is printed in full in this issue of the JOURNAL. While the main facts stated by Dr. Wise are such as no one can successfully controvert, there are one or two points concerning which some of our readers may differ with him.

While urging the necessity, which to those familiar with the subject is quite obvious, of a reform not only in the care of the dependent insane, but in the lunacy laws of Maryland, Dr. Wise said: "Create a State Lunacy Department and endow it with executive power, not confine it to visitorial and reportorial functions."

Upon this point, in all of the discussions which have taken place or which have been published, concerning the functions and powers of commissions of lunacy, very diverse views have been expressed. If we look back to the organization of the first lunacy commission, the English, upon the model of which all

subsequent commissions have been formed, the object, or at least the main object, if more than one is alleged, of such commissions is very evident. This object has been the creation of a board of inspectors or visitors, with certain well defined powers (not a managing or executive board), which might visit, inspect, inquire, receive reports, digest statistics, but whose main value was that, in behalf of the public, it had sure and ready means of access to all places where the insane were confined, and could judge for the public of the conduct of such institutions.

Such a board stands between the public on the one hand and the institutions, their managers and officers on the other. It can disarm unjust criticism and suspicion, or it can, where abuse is found (if active and efficient, and awake to its duties and responsibilities), set in motion the proper machinery of the law to remedy such abuse. In England and in those States which have boards intelligently informed upon their duties and responsibilities, much satisfaction has been felt by the public in the possession of such means of information, not so much that the poor rates were economically expended, but that their unfortunate friends and relatives in institutions were scientifically and humanely treated.

Can such satisfaction be assured from the existence of a board endowed with executive power? Such a board is at once, we believe, placed in an embarrassing position, and its greatest usefulness, not only to the public, but to the patients in institutions, is rendered weak and doubtful for the reason that it must explain, judge, excuse or condemn, acts for which it, by reason of its executive functions, is in a measure responsible.

We are all aware of the great work accomplished by the New York Board in carrying out State care, but one does not always have to read between the lines to find excuses and explanations, defence of acts and orders, which would come with better grace from such a board regarding the work of others rather than its own.

Who shall judge for the people of the wisdom and justice of the executive duties and the rules and orders of a board so endowed? The care of the insane is a great and growing problem in every community, and economy must be inculcated and practiced. If the standard of care, the plans of buildings, the price

of fish and flour, the dietary of patients, the clothing, occupation, etc., must be fixed by a central board, to secure greater economy of expenditure and a military uniformity of methods and reports, well and good. The great question, however, is constantly coming up, who, out of all this centralization of power, shall have the custody and report upon the custodians themselves.

The fathers and mothers, husbands and wives of the insane do not care one whit what uniform is prescribed for the farm laborers and herdsmen of institutions, but they do ask, Who can tell us that the standard of care fixed is carried out? How are our friends and relatives treated? Do you visit and inspect and report, and if so, upon whose work and rules do you report? Are you really unprejudiced?

We have watched with interest and admiration the energy and efficiency of the New York Board; we have often wished that some of these qualities might be imparted to other boards, but we are yet to be convinced, admirable as in the main are the results of the executive work in New York, that a great work does not yet remain in most of our States for a board endowed solely with " visitorial and reportorial functions."

Abstracts and Extracts

DIABETES AND GENERAL PARALYSIS. (DIABETIC PSEUDO-PARALYSIS).—R. Laudenheimer (*Archiv für Psychiatrie*, 29. Band, 2. Heft) considers the relations of diabetes to general paralysis as to symptoms resembling those of general paralysis. From a review of the somewhat scanty literature of the subject, and from the study of several cases, the following conclusions are derived:

1. That it is not yet determined that true diabetes causes true progressive paralysis, because in the cases up to this time so regarded, other causes have not had due consideration, and autopsies have not been made.

2. In occasional cases of diabetes there appears a symptom-complex of motor and mental weakness, which yields a complete clinical picture of general paralysis, which, so long as its anatomical basis is not known, may be diagnosed diabetic general paralysis.

3. The specific diabetic nature of this disturbance is shown in one case of the writer's by the prompt reaction under an anti-diabetic therapy.

RECOVERIES FROM MELANCHOLIA FOLLOWING REMOVAL OF INTERSTITIAL FIBROMATA FROM THE CERVIX UTERI.—Holmes (*Am. Gynæcol. and Obstet. Journ.*, Oct., 1897) adds three cases to those previously reported by him. This experience has convinced him that puerperal mania is nearly always dependent on some lesion of the generative organs. In 1885 he presented a report of fourteen cases, in which recovery had followed treatment of the pelvic organs, and since then ten additional cases of this form of insanity have been cured by him in a similar way, and three cases of apparently incurable melancholia associated with interstitial cervical fibromata have resulted in complete recovery on removal of the tumors.

The writer concludes that affections of the cervix and lower segment of the uterus produce a much more profound impression on the mental and nervous condition of women than disease of other parts of the generative apparatus, and that next after these tissues the vagina seems the most susceptible. He has on many occasions seen an aggravated vaginitis produce great mental irritability, and on one occasion he observed a case of violent puerperal mania recover under treatment directed to an inflamed vagina.

CONGENITAL FACIAL PARALYSIS.—At a recent meeting of the Society of Neuropathology and Psychiatry in Moscow, Dr. Minor showed a case

of this character presenting some interesting features. The patient was twenty-six years old. He was born of an intemperate mother, but no instruments were used at his birth. He was, however, much asphyxiated, being of a dark blue color all over. At the moment of birth it was observed that the face was strongly drawn to the left side. This condition still persisted, and in an aggravated form, but psychical development had gone on naturally until he was eighteen years of age, when he began to suffer from epileptic attacks. When he was shown there was facial paralysis on the right side. The zygomaticus major had escaped, and so had the upper part of the orbicularis oris. The platysma was much atrophied, and no electrical response to either current could be obtained in the muscles other than those mentioned as having partially or wholly escaped. Dr. Minor regarded the condition as the result probably of an intrapontine lesion, perhaps a hæmorrhage in the facial nucleus occurring at the time of birth, and associated with the asphyxia which was present. Some speakers, however, thought that the lesion might be in the nerve. Similar cases, it is pointed out, have been described by Schultze and Bernhardt, and also by Mobius. The last-named has described them as cases of nuclear disappearance in infancy.—*Lancet*, Oct. 9, 1897.

Religious Insanity.—According to M. Baderot, *Thèse de Paris*, (*Gaz. hebd.*, July 4) religious insanity is a very common type amongst the inhabitants of Brittany. It tinges all forms of mental disease, but is especially common in the more debilitated and degenerate cases. It is also frequent in alcoholic insanity. The delusions which are very persistent are generally terrifying, and ideas of damnation prevail.

To show the frequency with which this element tinges insanity, M. Baderot gives the figures of admission for the Rennes Asylum from January 1, 1896, to April 15, 1897. In one hundred and twenty-one male admissions it was present in twenty-five, or a percentage of 20.66. In one hundred and forty-three female admissions there were forty-nine suffering from religious delusions; a percentage of 26. These figures much exceed the general average in asylum admissions, at least in France, in his opinion.

Homicidal, Amnesic, Transitory Frenzy.—Dr. Bancroft reports two cases (*Boston Medical and Surgical Journal*, October 14, 1897). The first was that of a man of neurotic temperament whose domestic relations were unhappy. When the oldest daughter of the unhappy union reached the age of seventeen years the mother deliberately encouraged her entering a road house, separating herself and the daughter from the husband and other children. The knowledge of these facts goaded the husband to desperation. He grew depressed and gloomy. Gradually it was noticed that he was out late at night, that he watched the house in which his wife and daughter lived, and on returning home he would skulk behind trees, casting furtive glances over his shoulder, as though fearing pursuit. His wife finally began action for a divorce. While in the midst of this dread

he met, one morning at the railway station, his wife with one of the youngest girls. For several moments he tried to secure an interview with his wife, who dodged about the station. At last he came up with her on the platform. He was noticed pleading earnestly with her and the child, finally drawing both from the platform out in the street. Suddenly he drew a dirk knife from his breast pocket and nearly severed his wife's head from her body. He plunged the blade again and again in her breast. He made no opposition to arrest. In subsequent examination as to his sanity he never revealed any knowledge that his wife was dead, but stated that he remembered going to the station to plead with his wife not to get a divorce and take away his daughters. He remembered being distracted with a flood of conflicting emotions, fear for his own life, dread and horror for the fate of his daughters, anguish over the course his wife was pursuing. Suddenly all turned dark; he seemed to be in a whirl of confusion, and all he could recall was a struggle and a crowd of men pressing upon him.

The second case was that of a man seventy-nine years of age, who, for several months, had had delusions of suspicion and fear, with aural hallucinations. He had two sons, and thought that one of them with whom he was living was going to kill him, though there were no grounds for this feeling. He finally changed his residence to live with the other son, against whom he entertained no suspicion. He retained his fear of the first son, and was often seen looking behind trees and over his shoulder as though he thought some one was approaching from behind. He desired the family to keep the gun loaded and the doors and windows securely fastened. He was very deaf, and was easily startled, as by a slight touch, of any one accidentally brushing against him.

One day he was sitting in the kitchen. His grandchildren, a little boy about six years of age, and a girl about thirteen years of whom he was very fond and proud, were sitting on the floor bounding a ball between them. They would throw the ball on the floor, making it bound up to the ceiling and back again to one another. The old man sat in a chair with his back toward them, apparently having no thought of the children. The ball with which they were playing was a very light one. Suddenly it glanced back from the ceiling, striking the patient on the head. Instantly he started up in a frenzy of fear and excitement, seized a small hatchet that happened to be near, and rushing furiously toward the little boy, struck him on the head, fracturing his skull and killing him instantly. The little girl ran for the door screaming, but her grandfather reached her, made two or three slashes on her neck, shoulder and her scalp behind the ear. Fortunately the wounds were not deep enough to kill her and she eventually recovered. After inflicting these wounds on the girl he rushed out wildly into the road. The cries of the girl had attracted the attention of the neighbors who lived opposite and who ran out to ascertain the trouble. They found the patient panting with fear and excitement, talking disconnectedly, and apparently much dazed. He had not been drinking, and apparently, so the neighbors said, had no realiza-

tion nor recollection of what he had done. It is to be noted here that he did not at the time make any allusion to the homicidal act, nor ever afterward has he alluded to it. The entire occurrence was a blank to him.

In neither of these cases was there ever any record of epilepsy in any of its forms. The mental factors of the homicidal frenzy were unconsciousness and amnesia. In both cases there existed the most persistent state of mono-ideism. Presumably, an extremely limited circle of ideas was accompanied by functional associative activities in limited brain areas. Not that the entire brain did not perform the functions essential for ordinary life, but long-continued mono-ideism favored the functional exercise of certain brain paths more markedly than others. Consequently nervous activity sought these particular channels rather than others.

Both these cases lived in an unspeakable terror, both by day and night, that they were to be killed. In addition to this, in the first case the most horrible dread that a father could experience dominated and shadowed his daily existence like an awful cloud. He felt that his daughters, in whom his whole heart was bound up—even the little one scarcely out of her baby dresses—all were to be made common prostitutes in the course of time.

Both men had sought to arm themselves and prepare for the fatal moment which was likely to come upon them at any time. In the second case it was death; in the first it was not only his own personal death, but the moral degradation of his daughters.

Dr. Bancroft questions the occurrence of a transitory frenzy in an otherwise normal man, but in both these cases there existed a mental subsoil and psychical conditions favorable for the exhibition of an explosive psychosis, and he concludes that there may be a subliminal consciousness, that certain brain paths may be in active operation to the exclusion of certain other tracts that usually are, through their associative action, identified with the normal empirical consciousness—all this seems plausible and not inconsistent with what we already know of brain physiology and pathology.

The Relation of Mental Diseases to General Medicine.—Under this title Dr. Cowles summarizes the practical results of recent advances in psychiatry. (*Boston Medical and Surgical Journal*, September 16, 1897). A contrast is drawn between the "depleting treatment" of the first quarter of the century and the "supporting treatment" which accompanied the establishment of the scientific medicine of to-day. In appreciation of this principle alienist physicians have been leaders; Van Deusen's theory of "neurasthenia," a term introduced by him, antedating the publication of Beard's conception of "nervous exhaustion," manifested by "irritable weakness." The study of the nervous system and the exposition of the degenerative *sclerosis*, to which it is subject, have shown one great truth—that overwork and exhaustion may be potent causes of nervous disease, not only of a functional, but of an organic character, and the great significance of this, in relation to mental diseases,

lies in the inference that anything which interferes with the maintenance of proper nutrition of the neuron may begin by abating power in the mental function. The relation of mental to general diseases, on clinical lines, is thus a close one. The best advances in psychiatry have been made by the application of medical common sense, and there is no mystery in the adaptation of the principles of the "supporting treatment" to the needs of the insane. Such objective symptoms as might be noted, *e. g.*, constipation, dyspepsia, neuralgia, etc., would be palliated by the means any physician might employ, but this would be done with the understanding that they are all likely to be only expressions of the prime condition, which calls first for elimination, nutrition, rest and sleep; then for mental and physical hygiene; and then, as convalescence progresses, for proper exercise, entertainment, occupation and gradual restoration to self-responsibility.

Dr. Cowles reviews briefly later advances in the study of toxic influences, and of the anatomy and physiology of the nervous system, and concludes with a warning which may not be without value to hospital physicians as well as to a general medical audience:

"Now that mental pathology is becoming clearer in the light of general pathology, shall not a new interest arise in the study and treatment of insanity? Already the practice of alienists is getting upon new lines. Great success has been attained in some torpid mental and bodily states of long standing by the use of thyroid extract. Much attention is being given to the disinfection of the intestinal canal and its systematic and thorough evacuation by high enemata. Elimination of retained auto-intoxicants has been attempted with some success by the subcutaneous injection of large doses of a solution of common salt. These and other procedures are still largely experimental. But whatever you do, while you exhibit all the effective tonics, of which nutrition, rest and sleep, are the best, there is one controlling practical principle to be remembered, and, with this, one special caution. It is a safe rule that mental symptoms always mean weakness; excitement is an extreme degree of irritable weakness, in which there is great exhaustion in the mechanism of mental control. This thought should beget care in the use of sedatives and hypnotics. Beware of the coal-tar compounds and the like; they are good and sometimes necessary for proper use, but not for many days in succession. Change them and omit for a while; they go against nutrition, and drug intoxication often aggravates the disease and is mistaken for it. When your patient is taking food well, be content with his getting two or three hours of sleep or less in each twenty-four hours, even when excited. Such sleep is better than when it is drug produced. When the appetite flags and sleep is not produced by persistence in hypnotics, the complete suspension of all medicines, and frequent feeding, will often be followed by gradual cessation of excitement, a clearing tongue, and improvement in sleep. These brief hints are simply mentioned by way of example. Above all things it should be remembered that the indication is always for a "supporting treatment."

THE PRODROMES OF PARESIS.—Thomsen (of Bonn) read a communication on the early prodromal symptoms of paresis, at the International Congress of Neurology, Psychiatry, Medical Electricity and Hypnology, at Brussels, September 14 (reported in the *Progrès Medical*), the chief points of which are given as follows:

It is an incontestable fact that general paralysis is often unrecognized by practitioners, which is explainable by the following facts, (1) The duration of the disease is often longer than is believed; 5, 7 or 10 years is not very uncommon. (2) At the beginning the purely physical symptoms may so predominate as to cause a diagnosis of neurasthenia or cerebral syphilis. Moreover, there are frequently long and pronounced remissions during which all the psychic symptoms disappear. The anatomical basis of paresis is a process that is liable to remissions and which attacks very different nervous regions; hence follows the very marked difference between the symptoms and the cause of the disease. When the paralysis is manifest the anatomical process is well advanced. (3) It is not enough known that certain characteristic symptoms may precede the outbreak of the disorder a long time, even many years, as isolated or prodromal symptoms.

The Argyll-Robertson pupil, Westphal sign, transient ophthalmoplegias, paralytic or aphasic attacks, disturbances of articulation, optic nerve atrophy, and many others are of this category. Where these prodromata are met with in the history or in the *status praesens*, it is very often possible to make a certain or probable diagnosis long before the psychic symptoms appear; their recognition often relieves a possible confusion between this disease and cerebral syphilis or neurasthenia. It is very important to diagnose paresis in its early stages.

In the discussion following MM. Regnier and others agreed with Prof. Thomsen in making a distinction between paresis and cerebral syphilis.

THE ETIOLOGY OF PARESIS.—At the recent International Congress at Moscow a paper was read on this subject that is of some interest, in view of a certain still disputed question as to the agency of syphilis in the causation of paresis.

After noticing the general effects of the stress of modern civilization and the great increase of late years of the cases of the disease, he mentioned syphilis as the most important factor, and possibly as the one essential one (as likewise of tabes), and reported an experiment made in his clinic that has an important bearing on this question. Eight paretics in the advanced and hopeless stages of the disorder were inoculated with fresh secretion from a chancre and then kept under close observation for 180 days. In none of the eight was there any syphilitic manifestation whatever, and the conclusion is deduced that they were all latent syphilitics and hence immune to infection. The experiment is the more significant from the fact that in none of these selected cases had any primary manifestations of syphilis been observed.

As additional evidence of the luetic origin of paresis, Krafft-Ebing

adduces the facts of congenital syphilis in juvenile paresis, the greater frequency in urban communities than in the rural districts, its frequency amongst military men and its rarity in priests and females of the higher classes. Where syphilis is rare, paresis is also rare, its chief causes may be stated as "civilization and syphilization." Its advance must be checked by reducing the progress of syphilis.

THE SO-CALLED (EXTERNAL) DEGENERATIVE STIGMATA OF PARESIS.—P. Naecke, *Neurolog. Centralbl.*, Sept. 1 (preliminary comm.) reports the results of the examinations of 100 male paretics undertaken for the purpose of determining certain facts in relation to the etiology of the insane. For comparison 80 male hospital employes were also subjected to examination.

Of the 100 paretics, only 45 belonged to the cultured class, indicating the tendency of the disorder to extend amongst the uneducated. Most of the latter were from urban populations, where the stress of life is greater and the acquirement of syphilis is most easy. Most were admitted first between the ages of 36 and 40; the youngest was 25 and the oldest 56. All but thirteen were or had been married.

Hereditary taint (in the stricter sense) was found in 37; in 19 insanity in the family (in one case paresis). From the imperfection of the record Naecke thinks that 45 or 50 per cent would be nearer the true figures.

Syphilis was sure or probable in 43 per cent, which may also be taken as only a minimum figure. The objective signs were few and insignificant. In the known cases there were generally ten years or more between the infection and the paresis. The majority also of the specific cases had also hereditary taint.

Of other causes, intemperance was singly alleged in four cases (none of them absolutely sure), but was more frequent combined with other factors. Head injury by itself four times, but also more frequently in combination, and emotional disturbances six times by itself, and combined still oftener. Syphilis was in no case uncomplicated; one or more, commonly several other factors coexisted.

Dividing the paretics into two groups, those with predominant excitements and the quieter class, Naecke found, in 82 cases, 69 per cent of the latter. The assuredly syphilitic cases were divided about equally between the two. Paralytic attacks were observed in 53 per cent. Like other symptoms of the disorder, they seem to be of late less frequent and milder, and the average duration of the disease appears to be increased to three years and over.

The normal individuals used for comparison were generally young; 34 had been in the army, only two were weakly, and 12 undersized. Hereditary taint existed in 17.5 per cent, and probably more; none of them were absolutely free from abnormalities, and some of them had a whole series of stigmata. The value of these signs must therefore not be overestimated.

Careful and patient research on this point amongst the paretics demon-

strated that (1) they possessed an excess of these stigmata above normal individuals; (2) that they were more marked where they existed; (3) that the more important degenerative signs were found in the paretics, and (4) that their distribution over the body was more general than in the normal cases. Moreover, they were more common in the hereditarily tainted, and more pronounced; this was also the case with the uneducated as compared with the cultured individuals.

Thus, in about one-half the paretics we find the disorder occurring in a predisposed brain, as shown by the high percentage of abnormal heredity and the predominance of degenerative stigmata, and we find further that congenital peculiarities of character are especially common in these invalids. The non-congenital or hereditary weaknesses are also probably equally frequent.

Naecke claims to find a larger proportion of illegitimate births among paretics than is normal, and more cases of difficult birth; and that their offspring show more abnormalities than others. In fact, he concludes that they are generally cerebrally imperfect, and that this predisposition, either congenital or acquired through their lives, makes them ready victims to various exciting causes of the disease, chief among which seems to be emotional disturbances. Specific disease is, however, not essential; it may be lacking. It cannot in any case, in his opinion, be accepted as the sole cause, and is generally only a predisposing factor in an already invalid brain, rarely a direct exciting one.

He proposes in a future memoir to give fuller results of his as yet incomplete researches on the brain defects that favor the onset of paresis, which he thinks are more complete than have heretofore been made. They will, he believes, so prove the fact of the cerebral degeneracy in most paretics as to reveal to us the disorder in a different light than it has been thus far viewed.

Imprisonment and Insanity.—The *British Medical Journal*, September 11, 1897, makes some interesting comments upon the report of the Commissioners and Directors of Prisons for the year ending March 31, 1897, particularly upon the data relating to imprisonment and insanity. The total number of insane dealt with in local prisons was 380, of whom 216 were remanded for observation, and therefore already of doubtful mental state on committal. The majority of this number were found insane on arraignment. Excluding these cases, 164 remained, of whom 34 were recorded as having been previously insane and 121 were found to be insane on reception, so that only 43 of the whole number developed symptoms of unsound mind in prison. Analysis of the 43 cases developing in prison shows that 6 occurred within one week, 6 within two weeks, and 7 within a month. It is, therefore, obvious to any one who has even a superficial acquaintance with the development of mental diseases that imprisonment can have but little to do with the causation of any of them. Subtracting the 19 that became insane within a month, 24 cases remain which developed at a later period. Of this number only 5 cases

occurred after the completion of six months' imprisonment, the remainder occurring before the expiration of that time. These facts are, therefore, quite inconsistent with the view which has been reiterated from time to time in the daily press, that imprisonment gives rise to insanity; in fact, these figures seem to show the contrary. W. L. B.

MENTAL SYMPTOMS OF DIABETES.— Dr. De Veny reports a case of glycosuria with insanity in *Medicine*, October, 1897. There was marked and decided insomnia, controlled only by half-grain doses of morphine at bedtime, repeated in two hours, when relief was usually effected. The patient also manifested an inordinate craving for brandy, having been during his active business life rather abstemious. He took from two to three quarts of brandy daily. On diminution of the amount of sugar in the urine mental symptoms made their appearance. The patient was restless, agitated, had a disinclination to take food lest his family be ruined, claimed that he had lost everything and that it was necessary for him to go to the poorhouse, albeit he was wealthy. His attempts to wander off to the poorhouse necessitated the constant presence of a nurse. Although resembling the senile mental state even to the presence of erotic hallucinations, still the patient was in a mental condition more of a confusional type, since he could be temporarily recalled by questions from his son and partner in relation to his business. He was exceedingly exact in figures, and under questioning displayed a clear knowledge of his financial condition. This was in decided contrast with the delusions about the poorhouse, which immediately became dominant when he was allowed to sink back into his ordinary mental state.

While he was under observation the urine at no time exceeded forty ounces per diem. The sugar reaction, though always present, diminished or increased with the predominance or decrease of the mental disturbance. After some months' treatment at the Wauwatosa sanitarium his mental state so improved that he could once more be treated at home.

He then had loss of power in the left arm and both legs; the right arm was not at all affected; the legs and arms on both sides were, however, somewhat atrophied. The gait was decidedly ataxic. The tendon reflex was absent on both sides. Ankle clonus was present on both sides. His speech was slightly affected, and there was syllable stammering. After some time his mental symptoms began to reappear. The memory, however, at no time was affected. In this respect the mental state differed markedly from the senile mental state, which it otherwise simulated very much. The details of business even at the height of the mental disturbance were never forgotten, and sound advice was given to his sons in relation to it. At different times there was intense itching of the skin, and abrasions were difficult to heal. After some five years' treatment at home the patient's general state grew gradually worse. Carbuncles frequently appeared and exhausted the patient. He always complained of tenderness over the epigastrium, and was frequently jaundiced. Medicinal treatment was difficult, as suppression or diminution of the sugar in the

urine would cause an increase of the insane restlessness and a consequent decrease of the patient's strength. On the other hand, if the glycosuria were not checked to some extent the ordinary physical complications of diabetes were increased. Toward the end the patient declined to hold any intercourse with his family, was exceedingly apathetic, and took food only when compelled to do so. He refused it on the ground that he was unable to pay for it, and that by taking it he would starve his family to death.

KATATONIA.—An exhaustive discussion of this condition is given by Peterson and Langdon, in the *Medical Record*, October 2, 1897. The literature of the subject is reviewed and four illustrative cases from the wards of the Hudson River State Hospital are reported. The term is applied to a certain group of psychical and motor symptoms, which has often been considered as constituting a new and distinct form of insanity, but there is great diversity of opinion in regard to this.

The authors' study of the subject and of these cases leads to the following conclusions:

1. Katatonia is not a distinct form of insanity, not a clinical entity.
2. There is no true cyclical character in its manifestations; hence it cannot properly be classed as a form of circular insanity.
3. It is simply a type of melancholia.
4. It is not desirable, therefore, to retain the name katatonia.
5. The term "katatonic melancholia" or "katatonic syndrome" may be usefully retained as descriptive of melancholia with cataleptic symptoms, verbigeration and rhythmical movements, but should be strictly limited to this symptom-complex.
6. The prognosis in melancholia with katatonic symptoms is more grave than in any other form.
7. The treatment of the katatonic syndrome is the same as for other types of melancholia.

Book Reviews

Hallucinations and Illusions. By EDMUND PARISH. Scribners, 1897.

This book is enlarged from a German edition of 1894. Primarily it is a criticism of "The Report," made by the English Society for Psychical Research and kindred organizations, regarding veridical phenomena and "waking hallucinations." By way of thoroughness Mr. Parish reviews "the whole field of sensory delusion," normal and pathologic—whence we have a valuable monograph for psychology and for medicine.

Historically the book is ample, and the important points are well brought up to date. Beginning with the early explanation of "inadequate stimuli" (Joh. Müller), the "centrifugal" theory of hallucination and illusion is then reviewed under its various phases, namely, of "psychic projection"; of "ideas initiating and guiding the central apparatus of the sensory nerves" (Griesinger, Kraepelin); of "central action upon the sub-cortical sensory centres" (Hagen, Schüle); and, finally, in case of full-fledged hallucinations, of "centrifugal waves reaching the peripheral sensory organs," as the retina (Krafft-Ebing, Despine, Tamburini, Sergi, Lombroso, Ottolenghi). Rejecting all these, the author then plants himself on the doctrine that "the centres of sensory perception and the representative centres are identical."

Thus far the majority of experts are likely to agree with Mr. Parish. Yet immediately there rises the question as to precisely where the limits of these conscious centres are to be drawn. And when he decides for the cortex alone, as we understand him to do (the author is here, unfortunately, vague, in view of his criticism of other theories involving this point), Mr. Parish is apparently on ground that the latest authorities growingly incline to consider doubtful.

Arriving at his most intimate theories regarding hallucination and illusion, the author declares them both to be phenomena of "disassociation." Also, both originate in external stimulation, "not in one specific sensory stimulus, but in the general fact that the nerve-tract of the sense affected is at work; that instreaming currents from the periphery discharge the elements of the 'hallucinated centres.'" Whether hallucination, or illusion, or normal perception result, from the same stimulation, depends on "the cerebrostatic conditions present at the time." When the association paths into which the stimulus normally irradiates are "obstructed," either through "sleepiness," or through "exhaustion of the elementary group" so involved, and when at the same time "a certain close-knit group of elements is in a state of high tension," then

the stimulus "will be forced to discharge toward the group which has perhaps never before been affected by it":—this is hallucination. When "the excitability of the neural elements is low, a great number of the stimuli flowing into the cortex are not powerful enough to start the neural processes." As a consequence, certain parts of the customary association-group "drop out," and the result "misrepresents the sensation for which it stands because it is incomplete, and lacks the correction and adjustment which the dormant elements in consciousness could alone have supplied." This is illusion. Since hallucination and illusion are both initiated by external stimulation, the author reduces all false perception "to one type"—that of "illusion" commonly so-called.

It is doubtful if all the views of the author will find acceptance. When he declares that we should regard certain hallucinations as "illusory interpretations of morbid stimuli . . . originating in a pathological condition of some part of the central organ," this seems much like abandoning his contention that hallucinations and illusions may be reduced to one type in so far as external stimuli or objects are concerned. Moreover, it is not likely that many persons will concede that ordinary illusions—say those of binocular vision—are due to abnormal "disassociation, and to the exhaustion of the neural elements by which it is explained." Some illusions, at least, seem to us best explained as perfectly normal reactions to *unusual groupings* of outer stimuli. Throughout the book we feel that too much is made of this hobby of "disassociation." Continually we are forced to inquire why everything is thus credited to "exhaustion" of the centres, rather than sometimes to "excessive irritability," and why are *all* hallucinations and illusions forever spoken of as "blocked," "inhibited," or "split off" associations, while heightened or over-wrought association is conceived to be impossible. We hardly follow the author when he reduces "heightened tension" to "disassociation"; or when he declares that "if hallucinations occur in states of apparently accelerated association, as in mania, the excited period of circular insanity, etc., this arises from a misunderstanding of these states, which are really states of disturbed, and thus of *partially impeded association.*" We find, also, other evidences of driving a good horse to death; for example, when *all* "audible talking" hallucinations are explained as "unconscious whisperings."

On the whole we incline to think that, while Mr. Parish has produced a valuable work, he is at his best when giving a scholarly summary of current views, rather than when attempting constructive explanations of his own.

It was Mr. Parish's primary purpose, however, to confute the Psychical Research Report. This report declares that its census, taken from 27,329 persons, shows far more veridical perceptions (such as premonition of death) than can be deemed coincidental. The author, by his preliminary wide handling of his subject, is enabled to bring forward what appear to be sufficient explanations of these occurrences, upon less mysterious grounds. Even he finds grave error in the mathematics of The Census,

in that it counts each person, who reports having had a veridical perception, as an undivided unit of percentage in favor of true premonitions; whereas each individual should only count such a fraction here as his apparently true premonitions represent of *the total number of fancied announcements, both true and hallucinatory, which he has had during the years specified.* Or to state the point in rougher words than Mr. Parish's great courtesy and tenderness permit to himself: the truth of premonitions, instead of being computed, as it were, on the percentage of old maids who report having found a thief under their bed, should rather be based on the ratio of true finds to the number of times that each maid has looked for an intruder. We must agree with the author that this oversight "invalidates" the conclusions set forth in The Report. And we may do this while remaining in doubt as to whether or not there are such things as true "mediumistic," "telepathic" and "veridical" communications. The Report only makes clear that if there be such communications, it is next to impossible to arrive at a just estimate of them by any sort of census method based upon voluntary reports.

The New Psychology. By E. W. SCRIPTURE, Ph. D. (Leipzig), Director of the Yale Psychology Laboratory. Scribners, 1897.

The general notion for the production of this book was good; there is need that some one shall harvest the accumulating experiments of this field, to condensed, harmonious, readable form. Any attempt at this cannot be wholly without value, perforce of the richness of the material at hand. It is only by a travesty upon megalopsychy, however, that the title, "The New Psychology," should be put upon such a work.

Chiefly the book is a paranoiac account of a narrow range of investigation and apparatus in which the author is absorbed. It contains 44 foot-note references to publications by the author, and 20 more to those of his laboratory pupils; not to speak of a still greater overbalancing of the text. Some estimate of the reliance that may be placed upon the book may be drawn from the following example: Although overwhelming contradiction has been heaped against the author's experiments in "mediate association," this fact is passed over, in the author's voluminous account of the subject, by a foot-note stating merely that "several other investigators have failed to find cases of mediate association." In a spirit of warm tenderness toward Yale University we draw a curtain over the number of times the words "Yale Psychological Laboratory" occur.

To any one who has framed the conception that the New Psychology, of current fame, is a broad discipline, inspired by the wide evolutionary spirit of modern times, and sending deep, vital roots into natural history, into comparative zoology and physiology, into child study, and into the psychology of "crowds," of "society," of "history," and of all sorts of races and conditions of men, to such a one this book will come with saddening enlightenment. Even it has no lesson to learn from modern neurology, either normal or pathologic. The experimenter "cannot spend time on physiological speculation and anatomical metaphors,"

much less upon "arm-chair philosophizing." He has but to accept the purely non-metaphysical assumption that, in modern physics, "space is a form of energy," and then to sail ahead, confining himself wholly to "observation" and "measurement," *i. e.* without "arm-chair" *reflection* of any kind, not even so much as was bestowed upon the observation and measurement of the alchemists.

The previous book by this author, "Thinking, Feeling, Doing" (1895), he declares to have been brought forth for "the average unscientific reader." It is difficult to conceive the degree of "unscientific reader" for which the present edition is intended. In alternate lines, it ranges between expositions too childish for children, and oracular dogmatism outfathoming all modern physics and metaphysics combined. The facility of literary disjunction accomplished in these inharmonious leaps is only excelled by the masterly sweep with which long strings of unrelated declamation are whirled to concentric and indubitable conclusions.

The book is the product of such enthusiastic labor, and the former book has received such unmerciful censure, that in pure mercy, if not in entire justice to the author, we refrain from further comment, begging only that no one will soberly take this for "The New Psychology."

Sexual Disorders of the Male and Female. By ROBERT W. TAYLOR, A. M., M. D. Lea Bros. & Co., New York and Philadelphia, 1897.

The first work by Dr. Taylor on the Pathology and Treatment of Venereal Diseases, 1895, made for him a well-earned reputation, and this last book will add to the author's fame. Although based more or less on his first volume, this production has in it much that is new and valuable. It is meant not only for the general practitioner, but the specialist, and it gives us pleasure to recommend it without any limitations to the medical profession. It covers the whole ground of these disorders in a most thorough and concise manner; nothing of importance is left out, and nothing unimportant added. The treatment advocated throughout the book is conservative, but represents the best opinions of the day in these matters, and the difficulties in the treatment are distinctly stated and clearly met. We are glad to note the stress the author lays on the value of gradual dilatation of strictures in chronic posterior urethritis as against the plan adopted by so many good as well as bad practitioners, of immediate cutting; with dilatation, if properly carried out as described by Dr. Taylor, the ultimate cure, though it may take longer to attain it, is surer and in the end more lasting. The author's treatment of chronic prostatitis is also excellent; but there is no part of this work which is not good and which will not repay careful study. One interesting point that the author brings out is that so-called cases of "phosphaturia" may in reality be due to chronic prostatitis, and not to any trouble in the urinary tract higher up. This is a fact of distinct importance, and one not generally recognized by the medical profession.

Dr. Taylor's style is excellent, and impresses confidence in the reader; the book is abundantly and admirably illustrated, the illustrations are

among the best we have seen lately in any medical work, and the publishers have on their part put out a book which is altogether pleasing to handle and read.

As the author states in his first chapter, "for a thorough understanding of male sexual disorders more knowledge is required than is generally supposed. In the first place, well-grounded knowledge of general medicine and a general understanding of the anatomy, physiology and pathology of the nervous system are absolutely necessary," etc. We wish these words would be taken to heart by young men, who, on starting practice, think they are competent to be specialists, it matters little in what branch, since this statement is true of all. And for all men who are about to become specialists in genito-urinary diseases we most warmly advocate a careful study of this work.

A Manual of Medical Jurisprudence. By ALFRED SWAINE TAYLOR, M. D., F. R. S. Revised and edited by THOMAS STEVENSON, M. D. Lond. Twelfth American edited, with citations and additions from the twelfth English edition, by CLARK BELL, Esq., LL. D. Lea Brothers & Co., New York and Philadelphia, 1897.

This book has long been considered a standard work, and been in use by the leading medical colleges of the country. It has passed through several editions, of which this is the last, bringing it quite up to date as far as the legal points of view are considered. We do not wish to detract from the value of the work, but we believe it to be time that the book should be re-edited from a medical point of view. After a book has passed through various editions at the hands of different authors it certainly loses some of its original intrinsic value and interest, and one can hardly any longer consider it the work of any one author; but the fact of its long use and the absence of new text-books to take its place shows its permanent value, as long as the name of the author is retained. Since its first production it has been much altered by both lawyers and doctors, and we therefore see no reason why the alteration, as long as it is improvement, should not be thorough. The book is not up to date in its discussion or knowledge of medical topics. The references are old, most of them dating back twenty or thirty years, and if the book is to be really valuable to the physician there should be changes made. Under the heading of criminal abortion, p. 536, we read: "and it has been suggested by Acton that the presence of constitutional syphilis in the father is not only a cause of infection in the offspring, but of repeated abortions in the woman." That is all on syphilis as a cause of abortion—surely it has been more than "suggested"—it has been proven since Acton's time. On p. 711, in discussing the subject of idiocy it is stated that cretinism is accompanied by the enlargement of the thyroid gland; this is certainly not so in the very large majority of cases—there is usually absence of the gland. Again, in this same chapter, dementia is said to be caused by paralysis or hemiplegia; would it not be more proper to say that the same cause which produced paralysis or hemiplegia might, in the end,

entail dementia? These are perhaps all small points in themselves, and we might mention others, but they are sufficient, we think, to establish our claim that the work should be medically revised. In the chapter on impotency, although an attempt is made to draw a difference between this and sterility, yet there are several confusing statements, where one term is misused for the other. We do not approve of the term "neurotic poisons" where is meant poisons which specially attack the nerves; the word "neurotic" has come to be used in such an entirely different sense. One of the most important discoveries of the year 1896 was Florence's Iodine Test for seminal stains; we suppose this appeared too late to be noted by the editor, but to medical jurisprudence it is perhaps the most valuable addition of the last ten years or longer. It is a very delicate and easy test to make, and will undoubtedly be frequently used in medico-legal cases. There is no mention, as far as we have seen, of the use of the Roentgen Rays as evidence in court cases, but perhaps it is too soon to expect this in a work on medical jurisprudence. We believe that in one case already the judge would not allow photographs taken by this process to be used as evidence for or against the plaintiff.

But, after all, one is sometimes led to wonder for whom works on medical jurisprudence are written; we wish that, as far as the lawyers were concerned, they knew nothing of medical matters, their knowledge is ordinarily very superficial and they do not hesitate to use it unfairly. We believe with a good system of appointment of medical experts in all medico-legal cases there would be much less abuse of justice to all parties concerned. We should not see such disgraceful scenes as recently took place in the Leutgert trial in Chicago, nor have medical experts casting the lie, so to speak, in each other's teeth. At present our whole system of carrying on medico-legal trials is bad—the juries are most impressed by the divergence of the opinions of the doctors called by the two sides. We believe there would be no worse mistakes made than are made now, if doctors were not summoned at all. The majority of the medico-legal cases that are brought to trial in this country resemble a farce, as far as the doctors' opinions and testimony are concerned, and a miscarriage of justice as a result of the acts of the lawyers. It were better if doctors could keep out of them entirely, their own reputation—and with them that of the whole profession—would not then be continually lowered.

Correspondence

LETTER FROM DR. WISE.

To the Editor of the American Journal of Insanity:

In an editorial in the July number of the Journal a reference was made to training schools for nurses in the State Hospitals of New York that gives an impression of niggardly treatment of the trained nurse, by quoting one provision of the official wages schedule, whereby nurses' wages are advanced at the rate of one dollar per month, annually. The schedule provides that attendants, after graduation, shall receive from $20 to $28 per month, and shall be designated as nurses, the difference between minimum and maximum depending upon the ward position and time of service; and if men, from $25 to $33. The advance of one dollar referred to is an annual increase, but does not represent the increase that occurs when an attendant is transformed to a nurse. As a matter of fact, nurses, when deserving, get rapid promotion, but the above applies to those whose qualities keep them from promotion.

It has not been the desire of the hospitals to retain nurses in the service of the hospital after a full training, else the educational opportunity would be destroyed. A certain number are required as instructors and for the responsible positions, such as charge nurses. If the attraction to the nurse in the hospital was made so great that she would not leave it, the training schools would soon die of inanition. I sincerely hope that the policy of the general hospital will not be refused the special hospital in some degree.

P. M. Wise.

LETTER FROM DR. MOULTON.

To the Editor of the American Journal of Insanity:

I am familiar with the "boarding-out system" in Massachusetts and with the laws under which it has been administered, and Sir Arthur Mitchell's article in the Boston Medical and Surgical Journal of November 4, 1897, was in many respects most unfair and misleading. In neither the book reviews nor the editorials of the Journal do the writers express the real reasons why the number of insane in private families in Massachusetts does not increase, and your editorial note in the October Journal that "Mr. Sanborn's successors have not seen fit to take an active pushing interest in the work" is in grave error. The insane in Massachusetts were first boarded out in 1885. The number in families on September 30th of each year since has been as follows: 1886, 34; 1887, 73; 1888, 80;

1889, 110; 1890, 148; 1891, 155; 1892, 175; 1893, 164; 1894, 158; 1895, 142; 1896, 129; 1897, 121. It will be noticed that on September 30, under Mr. Sanborn, there were 34, 73 and 80 for the respective years of '86, '87 and '88.

I succeeded Mr. Sanborn in November, 1888, and for the three years following I made every effort to get suitable cases into proper families; and you will observe that the number of boarded-out insane increased to 110, 148 and 155 on September 30th of '89, '90 and '91, not large numbers in themselves, but to one actually acquainted with the facts a most satisfactory showing.

My successor, Dr. Woodbury, who succeeded me in 1891, has labored hard to board out patients, as the above figures prove, and the real reason for the failure of the "system" is truthfully stated in my paper of December 16th, 1897, Boston Medical and Surgical Journal.

There are several other points in the statements of the JOURNAL OF INSANITY which I would like to speak of, but I will refrain from further mention, except to protest against the statement that there have been real enemies in the Board of Lunacy and Charity against the system. I believe the boarded-out-insane system has a place in the treatment of insanity and that it is a most valuable adjunct, and I also know that the Board of Lunacy and Charity of Massachusetts is trying to do that which it believes will be for the best good of its insane and the people of the State. I have never seen evidence of enmity to the boarding-out system on the part of the Board, although some of its members naturally question its success under existing circumstances. The forthcoming report of the Board will contain recommendations which, if acted upon favorably by the Legislature, will make a large field for boarding out insane.

Yours very truly,

A. R. MOULTON.

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(*Extracted, by permission, from the Index Medicus.*)

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Obituary

JAMES OLMSTEAD, M. D.

Dr. James Olmstead, superintendent of the Connecticut Hospital for the Insane, died at the Hotel Grenoble, New York City, December 4, 1897, after an illness of about two months, resulting from overwork, exhaustion of vital forces, and mal-assimilation of food. This announcement may signify much or little, according to the point of view. To the world at large it means simply that a public officer, to whom large trusts were confided, has passed away. During his life no one dared to say that he was not honest, devoted and faithful. His constant endeavor was to administer the interests confided to him honestly, economically and faithfully. He felt that he belonged to the State which called him to serve its interests in the administration of a great philanthropic work, and he allowed no private interest to interfere with this high ideal of his duty.

But to his family, his friends, and to those who were intimately associated with him in his life labor, the announcement means much more. It means that the institution, of which he was the honored head, has sustained an irreparable loss. Who but those who were daily associated with him can know fully what a conspicuous illustration of fidelity he was to the large trusts committed to him? Who can know but his co-workers of the keen sense of responsibility he felt for the care of the unfortunate victims of mental disease who were committed to his charge in ever-increasing numbers? No time, no pains, no strength were spared if in any manner he might minister to their comfort, happiness and restoration. We know of the sleepless nights he spent in devising means to care for the increasing multitude of unfortunates for whom adequate accommodations were wanting. His days and nights were freely devoted to the problems which confronted him, and his sole thought was how he might honor-

ably restore his charges to health, home and society. The institution had expanded until it is now one of the largest in the country, and the details of administration had multiplied; yet he gave his personal attention to all its constantly increasing minor operations. He felt that he himself was personally responsible for the success of everything attempted. Not because of his distrust of the abilities of others in comparison with his own, for he was one of the most modest of men I ever knew, but because he loved the work to which his rare native gifts and acquirements were so unselfishly devoted. He could never be prevailed upon to take the rest he so much needed, because he claimed he was happier in his work. He was not so constituted that he was able to shirk the minutest detail. He seemed to fear lest the enterprise so dear to him might suffer were he to leave it, even for a brief space. Apparently he chose with deliberation and with manful resolution to die in harness rather than to sacrifice anything for his own comfort. Although we may claim that he erred in thus shortening his valuable life by overtaxing his powers of endurance, and assert that his gifts and attainments were of too high an order to be thus risked and lost, yet we cannot but admire his noble fidelity to his trust. Nor did he thus devote himself body and soul to his appointed work through any hope of public recognition or desire for self-aggrandizement, but solely from a sense of duty. He gave not only his time and money for the benefit of his patients, but gave himself, his life. Many are the instances where he has relieved the necessities of the needy from his private purse, and no one, even the recipients of his bounty, could discover the source of the benefactions, except in some accidental way. He never gave alms publicly for the sake of applause. Always quiet and unostentatious, he avoided public notice whenever it was possible. He hated shams of all kinds, and deception and equivocation were his special abhorrence. Although modest almost to shyness, he had a moral courage that was sublime where he felt that his duty was concerned. In the presence of a martyrdom to duty like his we must, perforce, bare our heads and say "Thy will be done."

He was a man of scholarly tastes and habit, and every moment that could be spared from the exactions of administrative work found him, book in hand, acquiring such information as he felt

would the better equip him for his life-work and render him more useful as a public servant. His controlling idea under all circumstances seemed to be how he might better subserve the interests of suffering humanity.

Socially, among his friends, Dr. Olmstead was a lovable man. He was thoroughly unselfish and always doing something for the personal comfort or benefit of those who needed it. In the sick room his tenderness and sympathy "surpassed the love of woman."

In the brighter days his merry laugh was contagious, and all nature seemed to smile when he was merry. He was knightly in his courtesy, and take him all in all, we shall not see his like again.

Dr. Olmstead was born in New Haven and was the only son of a well-known druggist of that city. He was educated at Yale University, graduating third in the class of 1872. Upon receiving his academic degree he pursued the study of medicine in the Yale University Medical School, receiving the degree of M. D. from his Alma Mater. He served as interne at the New Haven Hospital, after which he began general practice in the city of his birth. In 1876 he was appointed assistant physician to the Connecticut Hospital for the Insane, and continued as such until the death of Dr. Shew in 1886, when he was called by the Board of Trustees to the superintendency of the institution which he served so long and faithfully.

In 1882 he married Miss Emma Parmerton, daughter of the late John Parmerton, of Derry, N. H., who, with one daughter, still survives him, and was at his bedside when he passed away. For five or six years past he had every summer been prostrated, for a period varying from two to five weeks, by symptoms similar to those which characterized the beginning of his final illness, but from which, after a period of rest and treatment, he had heretofore recovered.

In the illness which finally terminated fatally, his vital forces were apparently too much exhausted for him to rally. A little over two weeks prior to his death he was persuaded to go to New York for much needed rest and treatment, but the change came too late, and despite the most skillful treatment and advice which the city afforded, he sank rapidly, and died December 4.

All that the loving care of a devoted wife and sisters could devise was at his disposal, but to no avail. His burial took place at the Grove Street cemetery in New Haven, December 7, in the presence of his family, several members of the Board of Trustees of the Hospital, prominent State officials, friends, and representatives of the institution with which he had been associated.

H. S. N.

Dr. George Allen.

Dr. George Allen, formerly First Assistant Physician at the Middletown State Homeopathic Hospital, at Middletown, N. Y., and more recently Superintendent of the Collins State Homeopathic Hospital, at Collins, N. Y., was born in the town of Poultney, Rutland County, Vermont, September 16, 1853, and died at Gowanda, N. Y., November 14, 1897.

We are obliged to record the early death of one of the most conscientious and faithful workers in the ranks of American psychologists. For twenty years Dr. Allen made a careful and special study of mental and nervous diseases. For more than one year he served as an interne at the Ward's Island General Hospital, where two wards were devoted to the care of the chronic insane. There he made his first studies in alienism. During his twelve years of private practice in Waterville, N. Y., he continued his investigations of the causes and sources of mental diseases. In May, 1890, Dr. Allen accepted a position as First Assistant Physician at the Middletown State institution, and there he wrought zealously, in behalf of the cause which he had espoused, for seven years, when he left to assume the cares and responsibilities of the projected institution at Collins.

Dr. Allen was not only a successful and painstaking physician, but he was likewise a careful and incisive writer. Among the essays which he left as a monument to his literary acumen we may name Paranoia, Circular Insanity, The Situation at Middletown (a dissertation on medical rights), Some Statistical Facts Concerning Insanity, and Phthisis among the Insane.

Dr. Allen was a quiet, patient, gentle, industrious and conscientious man, and his friends mourn with deep earnestness his early demise; and yet he left to his friends the soul-satisfying record of a life replete with good works in behalf of suffering humanity.

T.

APPEAL FROM THE RUSH MEMORIAL COMMITTEE.

To the Members of the Medico-Psychological Association:

At the recent annual meeting of the American Medico-Psychological Association, the undersigned were appointed a committee to co-operate with a similar committee of the American Medical Association, to urge the completion of the project to erect a memorial at Washington to Dr. Benjamin Rush. Since then the semi-centennial jubilee of the latter body has been held at Philadelphia, and a feature of the occasion was the enthusiastic resolve to raise a fund of *one hundred thousand dollars* for the erection of such a monument as shall be creditable to its illustrious subject and to the great profession of which he was so distinguished a member. This action makes it all the more incumbent upon the American Medico-Psychological Association to contribute its full share to the accomplishment of this commendable national undertaking. Dr. Rush's prominence as an alienist whose views were far ahead of his time, and whose work on insanity was a standard authority in Europe, as well as America, for more than half a century after his death, makes it particularly our duty to honor his memory—first, as one of ourselves and as a master in our special line of inquiry; and, further, because of his eminence as a teacher, writer and general practitioner and renowned Revolutionary patriot.

Your committee, therefore, most earnestly solicits your prompt subscription to the fund, which, it is hoped, you will make commensurate with this Association's estimate of this great physician and psychologist.

Contributions may be made to any member of the committee.

George H. Rohé, Sykesville, Md.
J. T. Searcy, Tuscaloosa, Ala.
John Curwen, Warren, Pa.
Benj. Blackford, Staunton, Va.
T. J. W. Burgess, Montreal, Can.
A. B. Richardson, Columbus, Ohio.
Wm. M. Edwards, Kalamazoo, Mich.
H. A. Gilman, Mt. Pleasant, Ia.
Chas. P. Bancroft, Concord, N. H.
P. M. Wise, Albany, N. Y.

SIR JOHN CHARLES BUCKNELL